

# The Canadian Medical Association Journal

FEBRUARY, 1954 • VOL. 70, NO. 2

## COMPREHENSIVE MEDICINE\*

KERR L. WHITE, M.D.,†  
J. S. L. BROWNE, M.D. and  
E. D. WITTKOWER, M.D., *Montreal*

MEDICINE, like most fundamental expressions of man's need for betterment, changes. The character, direction and velocity of the changes are determined by forces arising simultaneously in widespread areas. At the present time, four major developments are contributing to a vital re-orientation embodied in the concept of Comprehensive Medicine:<sup>1, 2, 3</sup> (1) the rapid increase in knowledge about homeostatic and adaptative mechanisms as conceived by Claude Bernard and Cannon and elaborated by Selye<sup>4</sup> and other workers<sup>5, 6</sup> in endocrinology and neurology; (2) the application of Freud's formulations to the understanding of sick persons suffering from a wide variety of illnesses other than neuroses and psychoses;<sup>7, 8, 9</sup> (3) regard for the growing contributions of the social sciences, particularly cultural anthropology, social psychology, and sociology;<sup>10, 11</sup> and (4) application of epidemiological techniques to the study and prevention of non-infectious diseases.<sup>12, 13</sup>

The present paper is a survey of representative contributions from the vast literature on these four broad trends to the three principal aspects of medicine—research, education, and patient care. Space has limited both selection and discussion of the literature but whenever appropriate, review articles giving further references are included.

### COMPREHENSIVE RESEARCH

A logical outcome of the rapid growth in medical knowledge has been not only a fragmentation of diagnostic and therapeutic techniques but also a profound segmentation of interests and

frames of reference, with a tendency for each segment to lead an autonomous flourishing existence. While it is true that medical science has advanced dramatically by research into ever narrower areas, it is unavoidable that preoccupation with the part prevents a view of the whole and an understanding of the relations between interacting systems. Should this trend persist, there is the risk that future medical research workers might be lacking not only in interest but also in capacity for taking a comprehensive view of human life with its concomitant individual and social manifestations.

A countermove to this trend has been the development of comprehensive research aimed at encompassing—without bias—a broadening spectrum of biological, psychological, social and cultural aspects of disease, and the transactions between them. Such an approach is difficult because the need for a high degree of specialization in research makes it virtually impossible for one person to acquire competence in more than two or, at the most, three related fields.<sup>14, 15</sup> It is apparent however, that ways must be found to study the exchanges which occur between systems, whether they be the enzymatic-cellular, the neuro-humoral, the organ system, the psychological or the socio-cultural systems.<sup>16</sup>

To achieve these aims two approaches have been adopted: (1) skills acquired in one discipline or specialty are applied to another; (2) skills acquired in different disciplines or specialties are applied concurrently to the same problem. There are five broad areas in which these approaches are used:

1. *Psychosomatic studies.*—Psychophysiological research is concerned with physiological concomitants of psychological states. For example, Wolff and his group in studying patients with disorders of the stomach,<sup>17</sup> colon,<sup>18</sup> nose<sup>19</sup> and heart<sup>20</sup> found correlations between life situations and emotions, and measurements of secretion, motility, vascularity, cardiac function, etc. Persky, a biochemist, and Grinker, a psycho-

\*From the Allan Memorial Institute of Psychiatry, and the Departments of Psychiatry and Medicine, McGill University, and the McGill University Clinic, Royal Victoria Hospital, Montreal.

†Present address: School of Medicine, University of North Carolina, Chapel Hill, N.C.

analyst<sup>21</sup> showed that following the administration of sodium benzoate, "patients who manifest free anxiety excrete elevated amounts of hippuric acid and that successful psychiatric treatment reduces the amount of free anxiety and hippuric acid excretion to normal levels." Reiser, Ferris *et al.*<sup>22</sup> studied hypertensive patients medically and psychiatrically and observed the adverse effects of emotionally stressful life situations on the course of the disease. In addition, the long-term maintenance of a well-considered doctor-patient relation with "superficial insight therapy" brought "relief of symptoms and improvement in total capacity," although there was no significant influence on the blood pressure. Margolin *et al.*<sup>23</sup> reported a study of gastric function in which a psychoanalyst, physiologist and gastroenterologist co-operated. Through a patient's gastrostomy, they measured fluctuations in gastric function (motility, colour, volume of secretion, acidity, and pepsin content) which are related to unconscious psychic processes and documented the profound influence of the observer, instrumentation, the research setting and hospital environment, etc., on the individual's responses. The changes in gastric activity were sometimes synchronous and associated, and at other times asynchronous and dissociated, suggesting the complexity of the relationships and the importance of unconscious as opposed to conscious attitudes. For example, the investigative activities of the physiologist were associated with conscious feelings in the patient of "hostility, resentment and humiliation and fear of angry rejection by the hospital if she was unco-operative." The unconscious mental content indicated erotization of the gastrostomy and the activities of the physiologist were felt as "an intolerable and frightful sexual violation". Other psychosomatic studies utilize psychiatric and psychoanalytic techniques to study patients with somatic diseases. For example, this approach has been used recently to study tuberculosis, a disease in which a known organism is an essential causative factor.<sup>24</sup>

Although earlier work in the psychosomatic and related areas, reviewed in texts by Dunbar<sup>25</sup> and Weiss and English,<sup>26</sup> stimulated research and thought, it is now generally conceded that studies confined to profile descriptions of personality and behaviour, or to the emotional impact of stressful life situations, or to the nature of the unconscious psychodynamic conflicts, are not

sufficiently comprehensive. Methods are needed for studying the transmission of the stimuli experienced in one system (*e.g.*, the social or cellular system) to other systems (*e.g.*, the psychological or organ systems) where responses find expression.<sup>16</sup> As guides for future research, therefore, important new conceptual models are being proposed, which cannot be briefly summarized here.<sup>27 to 31</sup>

2. *Somatopsychic studies* are concerned with the effects of disfigurement and physical disablement on behaviour and emotions. For example, studies<sup>32, 33, 34</sup> of patients requesting rhinoplasty revealed frequent psychopathological motives for requesting the operation. Barker *et al.*<sup>35</sup> and Wittkower<sup>36, 37</sup> described the emotional, occupational and socio-economic repercussions of permanent physical disablement. Hamburg *et al.*<sup>38, 39</sup> reported combined psychiatric and surgical observations of acute reactions to severe burns and that when these patients were treated psychologically as well as surgically their anxiety and pain were reduced and recovery accelerated.

3. *Psychosocial studies* were initiated by Sand<sup>40</sup> in Belgium, Ryle<sup>41</sup> in England, and Halliday<sup>42</sup> in Scotland. Ruesch and a team of psychiatrists, internists, social workers and psychologists in studying patients with duodenal ulcer<sup>43</sup> and other chronic illnesses<sup>44</sup> found high correlations between disabling intra-psychic conflicts, disturbed social and inter-personal relations and somatic morbidity. The manner in which disturbances in one of these areas was related to disturbances in the other two requires further exploration. Similarly, Berle, Pinsky, and Wolff<sup>45</sup> studied patients with "stress disorders" to determine the correlation between adjustments to life situations and improvement during treatment. They developed a rating scale of social, cultural and personal attributes which would predict patients most likely to benefit from psychotherapy. On another clinical level Stanton,<sup>46</sup> a psychiatrist, and Schwarz,<sup>47</sup> a sociologist, studied more regressed forms of illness in a mental hospital, and found that behaviour of mental patients was frequently a response to conflicts between different persons in charge of them, and that soiling was correlated closely with disturbances in the social situation.

4. *Epidemiological studies*.—Epidemiology now concerns itself with any reaction, disorder or injury which affects large aggregates of people,



and techniques of proven value in the understanding of infectious diseases now supplement the bedside and the laboratory which have been the traditional areas of medical research. To the usual consideration of man's physical environment is added the social component, *i.e.*, "that part which results from the association of man with his fellow men."<sup>12</sup>

Gordon<sup>48</sup> found that accidents follow the same biologic laws as other diseases and that they are approachable through epidemiological techniques. Extending their methods, and reviewing the literature on the distribution of suicide as an index of mental disorder, Gordon *et al.*<sup>49</sup> concluded that epidemiologists, through increased familiarity with the social sciences, should be able to contribute materially in the field of mental and emotional disorder. Defining a psychiatric patient as one "who is seeing and/or obtaining help from a psychiatrist," Redlich *et al.*<sup>50</sup> found uneven socio-economic class distribution of patients seen by psychiatrists. In addition, the patient population studied had the highest incidence of neuroses in the upper social classes, and of psychoses in the lowest classes. Methods of therapy also showed significant differences related to similar class divisions. The authors emphasize the need for additional research into the prevalence and types of psychiatric disorders in the general population.

5. *Sociological and anthropological studies.*—The physician's rôle in relation both to his profession and to medicine as a social institution has been examined in several different contexts. Hall<sup>51 to 53</sup> associated much of the medical profession's interdepartmental rivalry and its resistance to integrative and holistic view points with its social structure. Established members of the profession function "to provide order, to ascribe and maintain status, to control the conduct of members, and to minimize competition and conflict". Such value systems may promote the interests of the doctor but may have adverse effects on the patient. Similarly Harvey Smith<sup>54</sup> described a far greater degree of inter-personal tension between hospital departments than is found in industry. Using a "sociological perspective" Parsons<sup>55</sup> discusses the phenomenon of illness, the processes of therapy and the rôle of the therapist as "aspects of the general social equilibrium of modern Western society". The sociologist would regard somatic and psychosomatic illness as forms of socially acceptable "deviant"

behaviour, in contrast to other manifestations of personal or social conflict, *e.g.*, criminality or psychoses. The physician is regarded as a person occupying "a strategic point in the general balance of forces in the society of which he is a part" and in a position to take a therapeutic view not only of his present limited field but of human maladaptation in all its various forms.

The social and cultural anthropologists' view of human history enables them to place the trend towards comprehensive medicine in even broader perspective. Margaret Mead<sup>56</sup> stresses the potential value of studying the whole spectrum of society, the "well-adjusted," the "healthy" and the "successful," and not only the sick, the failures and the unhappy.

"A reconsideration of this whole position seems called for, not only if there is to be optimum communication between psychiatrists and anthropologists theoretically, but also if they are to work together toward a world in which we not only describe and analyze existing cultural patterns in an attempt to cure those who fail to use them but face the task of constructing, out of our insights, cultures in which human potentialities will have fuller play."

In brief, medical research which seeks to "comprehend" the patient and his relationship to disease agents, adaptive patterns, intrapsychic conflicts and the social milieu, involves co-operation by a variety of medical specialties and social disciplines. The ultimate objective is the development of a communicable body of principles to explain a host of seemingly unrelated facts in different frames of reference. Several deductions may be made from available psychological, physiological and social data: (1) The "single etiology" concept of disease is an over-simplification. Disease may result from the interaction of a series of variables some of which are more essential than others but all of which play a part in the disease process and any of which may operate by its presence or excess, or by its absence or deficiency. Frequently variables exist and are unknown. Other diseases are the products of a series of events or factors simultaneously or sequentially related in a mosaic or "network" of causality. (2) Disease may be regarded as a psychobiological failure of adaptation and integration. When so regarded, the patient's signs, symptoms, feelings and behaviour represent the overt communication of this failure. (3) Failure of adaptation may occur primarily at various levels, *e.g.*, the cellular, the organ system, the psychological or social, or at

the interfaces between different levels. Decompensation may occur at either one or several levels but failure at one level usually calls forth responses at the other levels. (4) Failure of adaptation usually results in regression to less differentiated patterns of cellular, organic, psychological or social behaviour and to a disturbance of equilibrium between different levels. Treatment to be effective should be focussed at the appropriate levels of regression and primary decompensation and should include a comprehensive view of the patient, disease agents and the social milieu.

#### COMPREHENSIVE EDUCATION

Medical educators are concerned about four issues: (1) how to cram the growing body of medical knowledge into an already overloaded curriculum; (2) how to prevent students from being flooded by a vast array of facts and knowledge without clear distinction between what is essential and what is not; (3) how to teach dynamic concepts of disease and adaptation rather than descriptive lists of syndromes; (4) how to teach "scientific" medicine without letting "the patient fade into a faceless, nebulous creature, often no more than a number on a test tube or an entry on a chart."<sup>57</sup>

The views have been expressed that medical education should be re-examined and re-arranged in the light of modern developments in medicine, and that students should be taught to take a comprehensive view of their patients with undiminished emphasis on the somatic panel but with due consideration for the psychological and social panels. In the immediate past teaching has been focussed too exclusively on the *impersonal* aspects and not sufficiently on the *personal and interpersonal* aspects which can, and should, be taught and subjected to further scientific investigation. This development is hampered by: (1) medical school teaching which concentrates disproportionately on matters of interest to the "specialized" teachers without sufficient regard for the needs of patients or students; (2) the erroneous premises that organic pathology is *the* fundamental "science of medicine", that diseases are best described by syndromes of signs and symptoms, and that they are due solely or primarily to specific disease agents; (3) the frequent construction of the curriculum and the allocation of teaching hours "by private treaty between virtually independent departments, whose deci-

sions are sanctioned by forty or fifty years of tradition."<sup>58</sup>

Recognizing these outmoded concepts, medical school deans, psychiatrists, internists, paediatricians and social workers have introduced changes in curricula aimed at developing a comprehensive viewpoint in students and at shifting the emphasis from diseases to patients. One approach is the introduction of first year lectures on psychobiology and psychosocial development and, occasionally, of more formal courses in sociology and cultural anthropology. At McGill University an "Introduction to Medicine" is provided by a first year course designed to integrate biochemistry, physiology and anatomy with the presenting complaints of the patient. In the second year, dynamic variations in biological behaviour from infancy to senescence, are presented as a comprehensive panorama designed to prepare students for the changing concepts of medicine in the future.<sup>58</sup>

Family care programs such as that at Boston University enable students to serve as "family physicians" for their final two years, to make regular observational and advisory visits to their families and later to take emergency home calls. Unusual opportunities are provided for learning preventive and environmental medicine, for seeing disease in its incipient stages, for observing the natural history of some conditions, and the impact on the family of acute illness and of psychosomatic disorders and chronic illness.<sup>59, 57</sup> At the University of Pennsylvania selected first-year students are appointed "family advisers" to clinic patients and their families. The student assumes graded responsibility during his four years for advising his patients on the advisability and mechanics of obtaining medical care. On the one hand he sees the patient's anxieties in response to psychological and socio-economic implications of illness, and on the other he sees the physician's reactions to the demands of many patients, and the intricacies of hospital medicine. It is noteworthy that at least half the questions asked by first-year students have referred to emotional problems in their assigned families.<sup>3, 59, 60</sup>

The New York Hospital and Cornell University have inaugurated a "Clinic for Comprehensive Medical Care and Teaching" organized about the ambulant patient but extending also into the home and community, and, when the occasion arises, into the hospital.<sup>61</sup> The primary aims are continuity of service to the patient and



of observation by the physician and student. The departments of preventive medicine and psychiatry co-operate with internists and pædiatricians who act as the family physicians, assisted by fourth-year medical students assigned to the clinic for five months. They treat the patients to the extent of their capacities and integrate specialists' skills as needed. In contrast to most outpatient departments, the specialist comes to the patient instead of patients being sent from one clinic to another with inevitable disruption of patient-doctor relations. Active participation of a psychiatrist, social workers and public health nurses in this clinic is broadening physicians' and students' approaches to medicine and should ultimately improve patient care.

Comprehensive medicine requires integrated teachers. To fill this need Harvard University has established a full-time course as an introduction to graduate study for Ph.D. degrees in basic medical sciences: anatomy, bacteriology, biochemistry, biophysics, pathology, pharmacology and physiology. The common course is taught jointly by members of the different basic departments of the Medical School and deals with the morphological and functional characteristics of cells, organs and organ systems. It attempts to extract from the medical sciences "the common principles and methods that are necessary for understanding the behaviour of living organisms". "Studies on bacteria, for example, include not only the usual morphological and pathological aspects, but also the biochemistry and biophysics of bacterial metabolism and the pharmacological interactions between bacteria and drugs". "The broader orientation achieved through the joint approach will give tomorrow's teacher, it is hoped, a better insight into how to restructure the teaching of medical students".<sup>3, 57</sup> Perhaps the most dramatic development in medical education is occurring at Western Reserve University.<sup>3, 57</sup> The traditional separation between "pre-clinical" and "clinical" teaching has yielded to a more realistic division of the four-year course into three phases. The first orients the student to medicine and the patient and presents the fundamental principle of man's structure, function, growth, behaviour and relation to his surroundings. It is taught not only by the basic scientists but also by internists, anthropologists, psychiatrists, social workers, etc. The student is assigned to a pregnant woman one month before delivery and follows her pro-

gress and that of her child for the remainder of the year. The second phase deals with disease, first by general principles and then by organ and site. The third phase deals with the care of sick people. Students now work in small permanent laboratories where the instructors come to them instead of the students moving about from one large laboratory to another as they did formerly. The opening day of the new curriculum has been described by an outside physician.<sup>62</sup>

"There was first a discussion by the professors of anatomy, pathology and microbiology on the importance of the basic sciences in relation to research, medical progress, and education. The growth of our knowledge of diabetes, respiration, vitamin K, and immunology was used to illustrate the theme. Then followed a description of the modern organization of medical care, community agencies, hospital team-work and the rôle of the family physician. . . . Later at the University hospital the new students met three patients in a comprehensive presentation. Terminology had been simple . . . and they were shown that illness is an intricate affair which could be looked at in many different ways. The implications of illness and the doctor-patient relationship were portrayed, and the prime importance of the basic sciences was there for all to see."

Enthusiasm for such revolutionary changes in medical teaching should be tempered by recognition of the dangers of over-simplifications, of spoon-feeding, and of students' varying rates of intellectual and emotional maturation. If students are called upon to "comprehend" all aspects of a disease or a patient's problems at too early a stage in their medical careers, they may tend to reject the broader view. Nothing is final or certain about any of these innovations but they represent some of the notable attempts to give new depth and meaning to the concept that the true physician must master both the science and the art of medicine.

#### COMPREHENSIVE CARE

Many of the developments described in the preceding section, although designed primarily for teaching purposes, are obviously patient-oriented. Other schemes have as their prime interests, improvements in patient care. Four principal objectives may be identified: (1) To effect a better adjustment between the "general" and the "specialist" approaches; (2) to support and encourage family physicians in their efforts to understand and care for their patients' health needs; (3) to promote integration and comprehension of the patient; (4) to supplement curative medicine with preventive medicine.

For example, at the Denver General Hospital (University of Colorado),<sup>57</sup> the new general clinic emphasizes the importance of continuity in the patient-doctor relation. Each patient is made the responsibility of a permanent staff member, although he is examined and treated by the same medical student and resident physician for extended periods. Specialists are consulted when necessary but the patient always returns to his original physician following the consultation; social workers and nurses assist in the care of the patients and their families. The service is extended to the home as required and into the hospital if the patient is admitted; a single record always accompanies him. Other objectives of the clinic are to practice good general medicine in terms not only of treatment but also of preventive and continuous health service.

The University of Tennessee has established a "family general practice" clinic staffed primarily by family physicians, whose talents for the diagnosis and care of patients are used to the utmost before a specialist is consulted. Medical students and residents learn the possibilities of giving their patients a high standard of care by developing their clinical judgment and using the simplest laboratory procedures. At the same time the implications of community problems are demonstrated by family physicians with first-hand knowledge and a social worker devotes full time to teaching in the clinic.<sup>58, 59</sup>

An encouraging feature of these developments in medical care has been the willingness of specialists to relinquish "sovereignty" and to co-operate in the re-orientation of their rôles in the care of patients. It is not a question of minimizing the specialists' contributions but of utilizing their skill in ways which are most useful to the individual patient and medicine as a whole.

Private group practice clinics are other expressions of the growing demand for comprehension of the whole patient and his problems. In many of these clinics the essential aim is to focus the vast array of diagnostic and therapeutic techniques on the patient for selective use at minimal cost.<sup>63</sup> Programs such as the Health Insurance Plan of Greater New York have demonstrated "that comprehensive medical care—preventive, early diagnostic, and curative—can be provided for an insured population under community sponsorship."<sup>64</sup> Of greater importance has been the restoration of the general practitioner to his former rôle of family counsellor interested in his

patients' health and welfare and not merely in "episodic illness."<sup>65</sup>

Still another development is the new medical centre being built in Hunterdon County, New Jersey, and organized to provide specialist help, as well as hospital facilities, to support the family physicians of the community. Consultants are selected on the basis of their "psychiatric orientation" and their enthusiasm for the comprehensive approach to the patient. The members of the Medical Centre will hold posts in the County Public Health Department and take part in developing educational and preventive measures in the area served. This ambitious program involves complicated administrative decisions, a realistic appraisal of community requirements and the abandonment by participating professional groups of many traditional prerogatives. It is nevertheless the sort of medical care plan which is a logical outcome of our present knowledge of medicine and the broad and continuing needs of patients and communities for improvement in the level of health. The Director of the Hunterdon County Centre puts the matter succinctly: "comprehensive personal medical care can only come with comprehension". The patient's interest must always be paramount.

#### CONCLUSIONS

Major revisions in medical thinking previously have been concerned either with its scientific principles or its internal organization. The development of Comprehensive Medicine differs from these to the extent that medicine itself is being called upon: (1) to assume its rôle as a social institution, and (2) to recognize and treat individual and communal ramifications of illness which far exceed the narrower concepts often acquired by interns and residents; that its major province is the treatment of organic diseases in hospitals. Five observations may be noted:

1. A shift in emphasis is occurring from curative medicine to preventive medicine and rehabilitation. Medical knowledge is approaching the point where it will be considered inadequate to make a physical diagnosis without accompanying psychological and social diagnoses. The isolated physician's efforts are being actively integrated with those of other health personnel.<sup>66</sup>

2. Individual private practice in isolated offices is being supplanted by group practice either in close proximity to hospitals or in health centres.



General practitioners and internists are recovering their status as the family physicians, and a more realistic balance between "generalists" and "specialists" is being achieved.

3. While it is true that isolated observations on single systems will continue to be essential for advancing medical knowledge, it is becoming increasingly apparent that more complete understanding is dependent upon a study of the interrelations between variables and systems. Research of this type requires interdisciplinary and multidisciplinary approaches for the study of transactions between interacting biological, psychological and social systems.

4. Dynamic patterns of human adaptation at all levels necessitate patients being studied for years and decades, rather than for weeks or months. Continuity of study, not only of isolated individuals but also of families and communities, and the growing sophistication of the public with respect to medical matters, make it desirable that clinical research be done in settings which provide concurrent comprehensive medical care.

5. In the light of the preceding conclusions medical curricula and teaching merit critical study and re-structuring in accordance with changing concepts of patients' needs, the nature of disease and research objectives.

What can be done in a practical way by medical schools and hospitals which have not yet formally recognized the full impact of these changes for research, education and patient care? Several possible approaches are suggested:

1. Committees might be established to determine the consequences for the local medical community of the trends in research, undergraduate and postgraduate education and patient care described in this paper.

2. Local population surveys might be made to determine patients' attitudes to medical care, insurance plans, "specialized medical practice", hospital and clinic practices, etc. Where this has been done the evidence has demonstrated the need for change.<sup>67</sup>

3. Surveys might be made of the attitudes of senior medical students, interns, and physicians newly embarked on general and specialist practice, to medical education and the relation of its form and content to the "medical facts of life."

If the evidence accruing from these sources indicates the need for change, the following suggestions might be considered:

1. Medical school committees might re-evaluate

curricula with a view to effecting changes in the light of experiences locally and in other medical schools. The importance of the cost of many of the proposed innovations cannot be overlooked but should not be used to deny the existence of the need for the change.

2. Hospital committees might consider plans for re-organizing hospital in-patient and out-patient departments, ancillary health services and community facilities in terms of the needs of patients (particularly ambulant patients) and their families. Pilot programs would be helpful in the initial stages.

3. "Comprehensive Medical Clinics and Wards" might be organized with continuity of personnel and patient service in which investigative teams composed of various specialized investigators conduct interdisciplinary research.

4. Inter-disciplinary committees might be formed; representatives of the medical and surgical specialties, psychiatry, preventive medicine, social work, sociology etc., would have a forum, for discussion of the interrelated problems of medical research, education and care.

#### REFERENCES

1. SASLOW, G.: *Bull. Menninger Clin.*, 16: 57, 1952.
2. GUZE, S. B., MATARAZZO, J. D. AND SASLOW, G.: *J. Clin. Psychol.*, 9: 127, 1953.
3. Commonwealth Fund: Annual Report, New York, 1952.
4. SELYE, H.: *The Physiology and Pathology of Exposure to Stress*, Acta, Montreal, 1950.
5. INGLE, D. J.: *J. Endocrinol.*, 8: 23, 1952.
6. MACLEAN, P. D.: *Psychosom. Med.*, 11: 330, 1949.
7. FENICHEL, O.: *The Psychoanalytic Theory of Neurosis*, W. W. Norton and Co., Inc., New York, 1950.
8. ALEXANDER, F.: *Psychosomatic Medicine*, W. W. Norton and Co., Inc., New York, 1950.
9. DEUTSCH, F.: *Acta med. orient.*, 10: 67, 1951.
10. CAUDILL, W.: *Applied anthropology in Medicine*, in Kroeber: *Anthropology Today*, The University of Chicago Press, Chicago, 1953.
11. LEAVELL, H. R.: *New England J. Med.*, 247: 885, 1952.
12. WINSLOW, D. E. A., SMILLIE, W. G., DOULL, J. A. AND GORDON, J. E.: *The History of American Epidemiology*, C. V. Mosby, St. Louis, 1952.
13. KERSHAW, J. D.: *An Approach to Social Medicine*, Baillière, Tindall and Cox, London, 1946.
14. CAUDILL, W. AND ROBERTS, B. H.: *Human Organization*, 10: 12, 1951.
15. ROHRER, J. H.: *Am. J. Psychiat.*, 109: 677, 1953.
16. GRINKER, R. R.: *Psychosomatic Research*, W. W. Norton Co., Inc., New York, 1953.
17. WOLF, S. AND WOLFF, H. G.: *Human Gastric Function*, Oxford University Press, New York, 1947.
18. GRACE, W., WOLF, S. AND WOLFF, H. G.: *The Human Colon*, Paul B. Hoeber, Inc., 1952.
19. HOLMES, T. H., GOODELL, H., WOLF, S. AND WOLFF, H. G.: *The Nose, An Experimental Study of Reaction Within the Nose in Human Subjects During Varying Life Experiences*, Charles C. Thomas, Springfield, Ill., 1950.
20. WOLFF, H. G.: *Circulation*, 1: 187, 1950.
21. PERSKY, H., GAMM, S. R. AND GRINKER, R. R.: *Psychosom. Med.*, 14: 34, 1952.
22. REISER, M. F., BRUST, A. A., SHAPIRO, A. P., BAKER, H. M., RANSCHOFF, W. AND FERRIS, E. B.: *Assoc. Res. Nerv. and Ment. Dis. Proc.*, 29: 870, 1950.
23. MARGOLIN, S. G., ORRINGER, D., KAUFMAN, M. R., WINKELSTEIN, A., HOLLANDER, F., JANOWITZ, H., STEIN, A. AND LEVY, M. H.: *Assoc. Res. Nerv. & Ment. Dis. Proc.*, 29: 656, 1950.
24. WITTKOWER, E. D.: *A Psychiatrist Looks at Tuberculosis*, National Assoc. for Prevention of Tuberculosis, London, 1949.
25. DUNBAR, F.: *Emotions and Bodily Changes*, 3rd ed., Columbia University Press, New York, 1946.
26. WEISS, E. AND ENGLISH, O. S.: *Psychosomatic Medicine*, 2nd ed., W. B. Saunders Co., Philadelphia, 1949.
27. KUBIE, L. S.: *Psychosom. Med.*, 15: 1, 1953.

23. MARGOLIN, S. G.: Psychotherapeutic Principles in Psychosomatic Medicine, in Wittkower, E. D. and Cleghorn, R. A.: Recent Developments in Psychosomatic Medicine, J. B. Lippincott Co., Philadelphia, in press.
29. RUESCH, J.: *Dialectica*, 5: 99, 1951.
30. SZASZ, T. S.: *Psychoanal. Rev.*, 39: 115, 1952.
31. WISDOM, J. O.: *Brit. J. M. Psychol.*, 26: 15, 1953.
32. LINN, L. AND GOLDMAN, I. B.: *Psychosom. Med.*, 11: 307, 1949.
33. MACGREGOR, F. C.: *Psychosom. Med.*, 12: 277, 1950.
34. MACGREGOR, F. C.: *Am. Sociol. Rev.*, 16: 629, 1951.
35. BARKER, R. S., WRIGHT, B. A. AND GONICK, M. R.: Social Science Research Council Bulletin 55, New York, 1946.
36. WITTKOWER, E. D. AND DAVENPORT, R. C.: *Psychosom. Med.*, 8: 121, 1946.
37. *Idem*: *Occup. Med.*, 3: 20, 1947.
38. HAMBURG, D. A., ARTZ, C. P., REISS, E., AMSPACHER, W. H. AND CHAMBER, R. E.: *New England J. Med.*, 248: 355, 1953.
39. HAMBURG, D. A., HAMBURG, B. AND DEGOZA, S.: *Psychiatry*, 16: 1, 1953.
40. SAND, R.: The Advance to Social Medicine, The Staples Press, London and New York, 1952.
41. RYLE, J.: Changing Disciplines, Oxford University Press, London, 1948.
42. HALLIDAY, J. L.: Psychosocial Medicine, W. W. Norton and Co., Inc., New York, 1948.
43. RUESCH, J., HARRIS, R. E., CHRISTIANSEN, C., LOEB, N. B., DEVEES, S. AND JACOBSON, A.: Duodenal Ulcer—A Socio-psychological Study, Univ. of California Press, Berkeley, 1948.
44. RUESCH, J., HARRIS, R. E., LOEB, N. B., CHRISTIANSEN, C., DEVEES, S., HELLES, S. H. AND JACOBSON, A.: Chronic Disease and Psychological Invalidism, A Psychosomatic Study, Univ. of California Press, Berkeley, 1951.
45. BERLE, B., PINSKY, R., WOLF, S. AND WOLFF, H. G.: *J. A. M. A.*, 149: 1624, 1952.
46. STANTON, A. H. AND SCHWARTZ, M. S.: *Psychiatry*, 12: 243, 1949.
47. SCHWARTZ, M. S. AND STANTON, A. H.: *Psychiatry*, 13: 399, 1950.
48. GORDON, J. E.: *Am. J. Pub. Health*, 39: 504, 1949.
49. GORDON, J. E., O'ROURKE, E., RICHARDSON, F. L. W. AND LINDEMANN, E.: *Am. J. M. Sc.*, 223: 316, 1952.
50. REDLICH, F. C., HOLLINGSHEAD, A. B., ROBERTS, B. H., ROBINSON, H. A., FREEMAN, L. Z. AND MYERS, J. K.: *Am. J. Psychiat.*, 109: 729, 1953.
51. HALL, O.: *Can. J. Econ. & Pol. Sc.*, 12: 30, 1946.
52. *Idem*: *Am. J. Sociol.*, 53: 327, 1948.
53. *Idem*: *Am. J. Sociol.*, 55: 243, 1949.
54. SMITH, H.: Sociological Study of Hospitals, unpublished Ph.D. dissertation, Department of Sociology, University of Chicago, 1949.
55. PARSONS, R.: *Am. J. Orthopsychiat.*, 21: 452, 1951.
56. MEAD, M.: Some Relationships Between Social Anthropology and Medicine, in Alexander, R. and Ross, H., Dynamic Psychiatry, J. B. Lippincott Co., Philadelphia, 1952.
57. BERRY, G. P.: *J. Med. Education*, 28: 17, 1953.
58. BROWNE, J. S. L.: *J. Clin. Investigation*, 27: 520, 1948.
59. HUBBARD, J. P., MITCHELL, J. M., POOLE, M. L. AND ROGERS, A. W.: *J. Med. Education*, 27: 19, 1952.
60. APPEL, K. E., MITCHELL, J. M. AND LEAMON, W. T.: *Diplomate*, 24: 89, 1952.
61. EVANS, L. J.: Society of the New York Hospital Record, p. 3, 1952.
62. SPILLANE, J. D.: *The Lancet*, 1: 94, 1953.
63. BOWLER, J. P. AND SYCAMORE, L. K.: The Responsibility of the Voluntary Hospital and its Medical Staff in the Distribution of Medical Service, Presented at Symposium Arranged by the United Hospital Fund, New York, 1944.
64. BAHR, G.: *Modern Hospital*, 80: 92, 1953.
65. *Idem*: *Am. J. Pub. Health*, 42: 131, 1953.
66. BARNARD, C. I.: Rockefeller Foundation—A Review for 1950-51, New York, 1952.
67. DICHTER, E.: A Psychological Study of the Doctor-Patient Relationship, California Medical Association, 1950.

## RECENT THERAPEUTIC ADVANCES IN DERMATOLOGY

L. P. EREAUX, M.D., C.M., Montreal

THE THERAPEUTIC HORIZONS in dermatology are constantly being broadened due to the close co-operation between the research departments of the major drug companies and clinicians working in many clinics. This general resume will discuss but a few of the newer products which have proved their worth in the treatment of our patients.

**Antibiotics.**—There is a tendency on the part of the profession to use the antibiotics with a reckless abandon, for all and sundry conditions. Specific indications must first be established by means of cultural evidence and sensitivity tests, before embarking on a course of antibiotic therapy. Recheck cultures and additional sensitivity tests must be undertaken throughout the course of prolonged infections. By these precautionary measures, resistant strains may be discovered and the allergic hazards attendant on the unnecessary administration of antibiotics can sometimes be avoided. If side effects occur they can best be controlled by: (1) Cessation of drug or changing to another type of antibiotic; (2) exhibition of cortisone in small doses for short

periods; (3) administration of the antihistamines in high dosage.

Pyodermsias respond readily to the newer antibiotic ointments which are now marketed in water soluble bases. Aureomycin, bacitracin, chloromycetin, ilotycin, neomycin, polysporin, tyrotrycin—all have found their valued positions in the cure of impetigo contagiosa, secondarily infected dermatitis and nummular dermatitis. Cultures and sensitivity tests to their spectra of activity will be the indication for their "expensive" use. Neomycin has a universal application, and its powder in 1% aqueous solution, when used as ear drops, provokes miracles in clearing up some infections of the ear canal. Neomycin ointment has served us well in the treatment of otitis externa, while in an ophthalmic ointment both aureomycin and neomycin have supplanted the use of yellow oxide mercury in the treatment of seborrhœic blepharitis and styes.

We do not now use penicillin or streptomycin ointments due to their high sensitization index. Antibiotic ointments act efficiently when applied as a thin film and do not require the thick applications of older type ointments to obtain the desired results.

It has become apparent in the treatment of furunculosis and folliculitis, that the antibiotics are useful only as emergency agents to quell the



fires of inflammation. For lasting pyodermic protection, one must lean heavily on vaccine therapy. Stock or autogenous vaccines are generally employed, but we prefer the administration of a suspension of autogenous vaccine in staphylococcus toxoid.<sup>1</sup> Follow-up booster injections of full final doses at monthly intervals for three subsequent injections are given, depending on the response of the staphylococcus titre.

Antibiotics injected in the centre of boils and cysts is a useful procedure. There is still no substitute for cleanliness in the treatment of superficial infections and quicker healing will be obtained by mechanical debridement with compress therapy or baths, than by placing complete reliance on antibiotic injections or applications.

Antibiotic troches used for the cure of oral conditions carry along with their therapeutic benefit the inherent dangers of contact sensitization of the mucous membrane. The newer preparations of aureomycin contain inhibitors to the overgrowth of monilia, but many a sufferer with pruritus ani acquired during a course of aureomycin therapy has rued the day this antibiotic was discovered. All too often, the omission of the administration of the B complex group gives rise to unpleasant "side, and end", effects.

The incidence of pruritus ani occurring during aureomycin therapy has decreased with the recently advised dosage reduction of the drug, which now routinely should not exceed one gram per day.

Herpes simplex, following viral infections, can occasionally be aborted by painting the lesions twice daily with 1% aureomycin<sup>2</sup> or neomycin film made up in methyl cellulose. One must first remove the superficial infected elements by compresses in order to allow a better penetration of the antibiotic.

Aureomycin and chloromycetin have their place in the treatment of herpes zoster, provided that these agents are administered in the early stage of the process. Indifferent response is obtained once the shingles are full-blown. Protamide,<sup>3</sup> a denatured proteolytic enzyme, has cut short the course of the occasional case of herpes zoster and has contributed to patient comfort. This product may be helpful occasionally, too, in the lightning pains of tabes. Chloromycetin<sup>4</sup> in the dosage of one to two grams daily for two weeks removes the blush of rosacea with its accompanying pustular elements. The hazards to the blood inherent in chloromycetin have been

pointed out by rival drug corporations, but fortunately in our series of rosacea no ill effects have been encountered.

Inconstant results are obtained in the treatment of molluscum contagiosum by the employment of aureomycin internally or by the use of aureomycin and neomycin films. One finds the percentage of cures following their use runs parallel to those obtained from the use of sulfa-pyridine. There is still no substitute for the curette for the rapid clearing of these troublesome infectious warts. Podophyllin 20% in alcohol has its advocates for the removal of molluscum contagiosum. The resurrection of this old drug from the therapeutic files of fifty years ago has proved a boon in the treatment, too, of condylomata acuminata. By its action, venereal warts melt like snow before the sun. The best vehicle to use for podophyllin is friars' balsam or alcohol rather than liquid paraffin, because exactness of application can be better maintained. This is professional treatment and should not be entrusted to the hands of patients. Do not use podophyllin on the face because of the danger of damage to the eyes.

*Stasis ulcers.*—The introduction of Varidase<sup>5</sup> has done much to accelerate tissue cleansing and repair in a multitude of infective processes. It has a particularly useful place in the rapid cleansing of varicose ulcers. The use of ichthopaste, dome boot, or of other supportive bandages of this type have made many fast friends for the surgeon and dermatologist in healing of long standing stasis ulcers. One must first remove the infective and exudative elements by the use of saline or 1% sulfanilamide compresses.

When the skin surface is clean and dry, powders or ointments of aureomycin, neomycin or terramycin are dusted or applied over the affected parts and the limb is then enveloped from the toes to level of the knee and the bandage is left thus from five to seven days. As healing progresses the bandage periods may be extended up to two to three weeks, and healing may further be accelerated by the application of water soluble tar ointments, applied to the broken surfaces and then covered by the Unna's boot dressing.<sup>6</sup>

Finally, surgical appraisal, with a view to corrective ligation, may be found necessary in a percentage of cases. Elastic stockings or tensor bandages should then be advised to prevent a recurrence of the condition.

*Antihistamines.*—The antihistamines are with the vitamins in the multiplicity of their products offered to the profession. All antihistamines are of therapeutic value but also possess unpleasant side effects capable of producing nausea, dizziness, or dangerous "hangover" effects. Persons receiving these drugs should be warned against possible drowsiness, and high dosage should not be considered for the ambulatory patient.

Insufficient dosage of the antihistamines has contributed in a large part to our past failures in clearing urticaria and many toxic eruptions. Histamine-flooded tissues in the acute allergic disorders need massive doses of the antihistamines to stem the allergic tides. We do not now hesitate to give 100 mgm. q.3 h., up to 800 mgm. daily, until symptoms are brought under control. Antistine, 2 c.c. (100 mgm.) by the intramuscular route, has proved a useful drug in our hands.

Fractional doses of the antihistamines are useful in controlling pruritus during the waking hours, while doses of a larger magnitude generally induce a comfortable night's rest. When heavier sedation is required chloral hydrate in capsule form gives more favourable results than do the barbiturates. These latter, we suspect, tend to increase the patient's itch when their sleep provoking attributes have worn off.

Antihistaminic ointments play a questionable rôle in dermatological therapeutics. Spectacular results have been reported in the treatment of the neurodermatitides but their danger of skin sensitization keeps lurking in the background. Ointment of this type reinforced with any one of the variety of the "caine" derivatives should be shunned by the knowledgeable physician.

*Sulphonamides.*—Medical journals daily record the discovery of new sulphonamide compounds. These and the triple sulfas aid the acne sufferer in the pustular phase. In dermatology, sulfapyridine has proved the most reliable controlling measure that we have yet been able to offer to the patients with dermatitis herpetiformis. For those intolerant to this drug, it has been suggested that doses of folic acid, five microunits, be given with each dose of the drug, or that the sulfapyridine be made up into an emulsion<sup>7</sup> and given in homeopathic doses to those who find difficulty in absorbing this otherwise toxic radical. Sulfoxone diasone<sup>8</sup> has been suggested as an improvement for the control of dermatitis

herpetiformis. It is a toxic drug and needs more careful supervision than does sulfapyridine.

The late Dr. Harold Orr drew our attention to the benefits to be derived from a 1% aqueous sulphanilamide solution as a means for controlling the secondary invaders in infectious eczematoid dermatitis, nummular eczema, and stasis dermatitis. Over several years we have not encountered one single case of sulpha sensitization due to the employment of these compresses.

*ACTH, cortisone and hydrocortone.*—Much has been written concerning the life-saving attributes of these drugs in the treatment of lupus erythematosus acute disseminata and pemphigus.

Pemphigus, that rare but hitherto invariably fatal disease has responded in dramatic fashion to the treatment with the cortico-steroids. Seventeen cases of all types of pemphigus have been treated by the Royal Victoria Hospital group during the past three and one-half years. Cases have been maintained on these drugs for periods varying from six months to three and a half years. Fourteen of our cases have survived; all but one of these are again leading useful lives. Seven "cures"? have maintained their gains and have averaged better than six months without treatment of any type. The three cases who succumbed were of the acute fulminating type and death occurred within three to four weeks after onset of therapy.

ACTH, cortisone, and hydrocortone should be reserved for the treatment of life-threatening dermatoses, but they also have their place in treating acute allergic disorders too. Urticaria, drug eruptions, the erythema multiforme group and contact dermatoses of plant and chemical origin can be rapidly cleared under short courses of these drugs. The bald-headed may bless the day of their discovery, for they have accelerated the rate of regrowth in early cases of alopecia areata by internal and topical use.<sup>9</sup>

The indiscriminate use of ACTH and cortisone for the chronic group of skin disorders, such as atopic dermatitis, psoriasis, and exfoliative dermatitis is fraught with danger. Routinely, all evidence of these diseases clear within two to five days while patients are on the drugs, but after withdrawal, at a later period, severe relapses tend to occur. ACTH, cortisone, and hydrocortone stop the disease processes in their tracks but when this braking effect is removed, the pathology tends to recur and progress further afield.



With increasing publicity, ACTH and cortisone are being administered in a wholesale fashion, and we in dermatology are daily being called upon to untangle the complications arising from their injudicious use by the profession. Many will be at variance with this statement, but I maintain that ACTH and cortisone as systemic remedies control much, cure but few, and may actually aggravate a multitude of self-limited skin conditions.

Cortone and hydrocortone instillations are beneficial in treating many ophthalmological and otological conditions, and special mention must be made of acute interstitial syphilitic iritis and otitis externa.<sup>10</sup> The drug of the year is hydrocortone acetate when employed in ointment form. To quote Sulzberger:<sup>11</sup>

"Hydrocortone ointment gives considerable promise as a local external therapeutic agent in selective common dermatoses, as well as being effective by subcutaneous injections for some skin lesions and skin reactions."

Ointments employed in a 1 or 2½% concentration made up in a paraffin or carbo-wax base, yield results similar to those obtained by the parenterally administered cortone or hydrocortone, without the danger of the troublesome side-effects. Hydrocortone ointment unfortunately possesses the limitations of the parenterally administered cortone or hydrocortone, in that, in many cases, on withdrawal of the ointment, a relapse of the condition under treatment occurs.

It is the preparation *par excellence* for the treatment of acute contact dermatitis of allergic causation. Its itch-relieving properties in the treatment of infants suffering with atopic dermatitis are excellent. Cosmetic, chemical and plant dermatoses, and contact dermatoses, clear under its influence. Many cases of atopic dermatitis, neurodermatitis, pruritus ani et vulvæ, have been benefited. This improvement, however, is not always sustained when the drug is withdrawn. It is a product to conjure with and, when a better understanding of its action is learned and techniques perfected, it may be the coming preparation for the dermatologist. In our hands, cortone 1% ointment was beneficial in the treatment of early keloid and of lupus erythematosus of a chronic discoid type.

The liquid hydrocortone has been advised intradermally for the treatment of such varied conditions as: discoid lupus erythematosus,

localized neurodermatitis, and isolated plaques of psoriasis. In the synovial type of cyst, or in the mucous cyst, injection therapy has caused resolution of the process.

**Vitamins.**—The Charpy, Dowling, Thomas method with its use of D-2 in the treatment of lupus vulgaris has been an outstanding advance. D-2 has served well in the treatment of cutaneous sarcoidosis, and some reports praise its use in the treatment of atopic dermatitis and even in acne vulgaris cystica. Vitamin A internally has improved cases of acne vulgaris and as an ointment has been helpful in ichthyosis and in removing seborrhœic warts. Isonicotinic acid hydrazide is running the gamut of trial in lupus vulgaris and allied tubercular conditions. In erythema induratum and even in leprosy it has proved its worth.

**Hormones.**—The field of usefulness for hormone therapy in skin is ever-widening. Estrogens internally and topically have benefited the acne vulgaris sufferers<sup>12</sup> and Barber has found them beneficial in the treatment of seborrhœa of the scalp. A premarin-containing ointment has improved cases of rosacea and has been useful in the treatment of x-ray dermatitis.

**Miscellaneous preparations.**—Notwithstanding the apparent failure of the reeking goat on yonder hill to become sweet and pure with chlorophyll, we have found the aqueous soluble chlorophyll 1% concentration in a wetting base a deodorant *par excellence* in the care of our pemphigus patients. Perhaps, the odour from the secondary invaders has been cut down by the action of the antibiotics and the skin has been kept firmer by the use of the adrenocortical extracts. However, the stench of pemphigus cases can now be controlled by ointment application and by chlorophyll fans. Infective surfaces and stasis ulcers have also responded to 1% chlorophyll ointment. One must watch for possible sensitizations.

With present day knowledge, the best way to stop dandruff is to employ selenium disulphide.<sup>13</sup> This is a commercial product marketed under the name of Sel Sun, but woe betide the person who does not completely cleanse cosmetic preparations from his or her scalp prior to its application. With improper prior cleansing of the scalp, yellow, green and even purple hair has resulted following its application. It is the best preparation to date for the treatment of cradle cap or the seborrhœa capitis at any age. Warnings have been issued about the toxicity of this prepara-

tion. During a two-year trial we have found it to be well tolerated by most individuals.

*Antipruritics.*—The search still goes on for the ideal antipruritic application for the skin. Several preparations have recently been advanced for this important purpose. Quotane<sup>14</sup> is useful and has minimal sensitizing effect. The preparation Eurax,<sup>15</sup> in a vanishing cream base, is an excellent scabicide and also an antipruritic of the first order.

Dermatitis venenata from poison ivy is with us in all seasons, caused in summer by contact with the plant, and at other times by dried plant elements, or even from contaminated articles. With the advent of the zirconium salts,<sup>16</sup> an advance has been made in aborting or neutralizing the irritating plant juices. Zirconium ointments work effectively against the fresh application of oleoresin on the skin but after prolonged contact their therapeutic efficiency is inclined to be impaired.

Ethyl chloride<sup>17</sup> sprayed once daily for four or five days on the lesions of poison ivy reduces the itch and the period of disability. High promise awaits the use of hydrocortone ointment in suppressing the action of these irritating plant resins on the skin. Cortone internally, in selected cases, cuts short the period of disability of the plant dermatitides. Oral hyposensitization methods with the oleoresins for the desensitizations of ragweed dermatitis offers relief for this rebellious condition. Following the oral desensitization treatments the exit portion of the G.I. tract may register a vigorous protest against this regimen by developing pruritus ani.

Banthine and probanthine have aided those suffering from dysidrosis and bromidrosis.

*Unsaturated fatty acids.*—The unsaturated fatty acid compounds were introduced as antimycotic remedies. They are fungistatic, not truly fungicidal, and have proved to be non-irritating to the skin when used over a long period. Some compounds have the disadvantage of possessing an unpleasant odour and, although helpful, we have not found them to give constant results in treating fungus infections.

The search continues for a specific agent against the infections caused by the various ringworms. Many of the newer products have claims based on the results obtained *in vitro*. After clinical trial they fail to effect cures. Undecylinic acid, when used as an antimycotic agent, can

best be employed in conjunction with zinc or copper undecylinate.

The use of undecylinic acid in the treatment of psoriasis is now no longer extolled. Some three years ago we at first thought that this new treatment held promise for the cure of psoriasis, but in the overall picture found but 5% who seemed to have clearing of their lesions following its ingestion. On later examination few of the cases which showed primary benefits, failed to maintain their gain. One compound, F99, which has had great vogue with the laity has increased the practice of G.I. specialists from resulting gastrointestinal upsets.

Great promise has attended the use of stilbamidine in the treatment of actinomycosis and blastomycosis, and the suppurative ringworms.

*Atabrine.*—Atabrine was first reported in Russia in 1941 and later in England in 1951<sup>18</sup> as a successful treatment of lupus erythematosus. The lesions of the chronic discoid type of this disease have dissolved away following its administration. The drug may be toxic to certain individuals, but if the dose is carefully controlled, few side-effects will be encountered. At the onset we felt that it was necessary to give Atabrine till the patient's tissues became yellow from the dye. Now under the dosage schedule of 100 mgm. three times daily for a week, 200 mgm. per day for the following week, and 100 mgm. daily for the remaining period up to six weeks, we have had comparable results under this regimen as were obtained by heavier dosage in the first trials. Patients are appreciative of the savings effected, and the freedom from repeated unpleasant intravenous and intramuscular injections of gold and bismuth afforded by this treatment. Chloroquine succeeds at times when atabrine is not well tolerated.

It should always be kept in mind that sunlight is injurious to sufferers with lupus erythematosus, and some screening ointments or lotions, as well as a protective hat, should be used to shield patients from the injurious actinic rays. Atabrine, chloroquine, and quinine, appear to increase the tolerance of the skin to the sun's rays. In this way these are doubly beneficial in treating lupus erythematosus.

*Barrier creams.*—In the industrial field, the introduction of barrier creams has been a step of major importance. The conservation of manpower and the keeping of skilled labour at their posts during war time in England, instigated



much research in combating the industrial dermatitis arising in war plants. Now through the medium of the Kerodex products a complete range of protective barrier creams is available for all types of industrial needs. By their use skilled workmen experiencing allergic reaction to their industrial contacts may, in many cases, be returned to their posts with complete protection against further trouble. Barrier creams have also been designed to protect the harassed housewife in the pursuit of her routine chores.

The silicone compounds made up as protective creams have recently been introduced into dermatology. Covicone, one of these, will afford protection against many types of industrial, household, and plant irritants. The water-proofing effect of the silicones protects the skin against body fluids and their use will prove to be a boon to pædiatricians and surgeons in the prevention of skin irritations met with in their specialties. Barrier and protective creams are not primarily therapeutic agents and should never be em-

ployed as healing agents on broken skin surfaces.

Thus, dermatology by the use of new and improved preparations and its older standard formulæ continues to offer protection, care, and cure for many of the ills of the flesh.

#### REFERENCES

1. KALZ, G.: Personal Communication.
2. KALZ, F. et al.: *Canad. M. A. J.*, 61: 171, 1949.
3. COMBES, F. C. AND CANIZARES, O.: *New York State J. Med.*, p. 15, March, 1952.
4. *Presse, Méd.*, 60: 424, 1952.
5. TILLET, W. S., SHERRY, S., CHRISTENSEN, L. R., JOHNSON, A. J. AND HAZELHURST, G.: *Ann. Surg.*, 131: 12, 1950.
6. COOPER, W. M.: *Am. J. Surg.*, 75: 483, 1948.
7. CRAIG, G. E.: Schoch letter, Dallas, Texas, March, 1953.
8. CORNBLEET, F.: *Arch. Dermat. & Syph.*, 64: 684, 1951.
9. DILLAHA, C. J. AND ROTHMAN, S.: *J. A. M. A.*, 150: 546, 1952.
10. NELSON, C. T.: Personal Communication.
11. SULZBERGER, M. B., WITTEN, V. H. AND SMITH, C. C.: *J. A. M. A.*, 151: 468, 1953.
12. KALZ, F., PRICHARD, H., FOURNIER, C. AND JANAUSKAS, A.: *Canad. M. A. J.*, 67: 5, 1952.
13. SREPYAN, A. H.: *Arch. Dermat. & Syph.*, 65: 2, 1952.
14. LYNCH, F. W. AND ACKERLY, O. E.: *Arch. Dermat. & Syph.*, 65: 35, 1952.
15. PECK, S. M. AND MICHELFELDER, T. J.: *New York State J. Med.*, 50: 1934, 1950.
16. CRONE, G. A.: *Arch. Dermat. & Syph.*, 66: 282, 1952.
17. ROBINSON, M. M.: *J. Invest. Dermat.*, 8: 239, 1947.
18. PAGE, F.: *Lancet*, 2: 755, 1951.

### THE ROOTS OF PSYCHOSOMATIC MEDICINE\*

IAGO GALDSTON, M.D., New York, N.Y.

THE INVITATION to trace the roots of psychosomatic medicine could with full warrant be taken as a commission to scan the full panorama of medical history. For medical history reveals that since the most ancient of times, even before the days of Hippocrates, physicians knew that the psyche and the soma were intertwined in a reciprocal relation. Plato pronounced an already ancient injunction when he warned:

"For this is the great error of our day that in the treatment of the human body, physicians separate the soul from the body."—Plato, *Charmides* 156-157.

I shall not, however, inflict upon you so great a résumé, and indeed on this score there is no need to scan the more remote history of medicine. That has already been done by the incomparable Burton in his *Anatomy of Melancholy*. In this superb volume there is to be found all the references bearing upon the protean distemper Melancholia which the most catholic of compilers could gather.

\*An address delivered at the Allan Memorial Institute of Psychiatry, Montreal, on October 21, 1953.

Yet precisely because I will not inflict upon you a résumé of medical history from the point of view of psychosomatic medicine I deem it no imposition to dilate on this most extraordinary man and his work. The occasion is appropriate since it was Osler who first recognized the psychiatric import of *The Anatomy of Melancholy*. He considered it "the greatest medical treatise ever written by a layman." Osler was enchanted with the man and intrigued by his work. In an address delivered at Oxford, England, on April 24, 1916, Osler linked Burton with Shakespeare and Bacon, and crowned him the transmuter supreme in the triad of Creators, Transmuters, and Transmitters.

"The silent, sedentary, solitary student (as he terms himself) in the most flourishing college of Europe, augustissimo Collegio, with Saturn lord of his geniture, to relieve a gravidum cor, swept all known literature into a cento. No book was ever so belied by its title as *The Anatomy of Melancholy*."<sup>1</sup>

Osler recognized the psychiatric import of the *Anatomy*, but he never elaborated upon it. This was attempted in 1944 by Bergen Evans in a work entitled *The Psychiatry of Robert Burton*.<sup>2</sup> The achievement is creditable. Evans, however, missed the unique value of the *Anatomy* as a repository of psychiatric history. But better than

any other writer he celebrates Burton's appreciations of the frustrations inherent in the present structure of society.

"The important thing," wrote Evans, "and it is very important—is that he (Burton) saw in cultural determinants the bases for disturbances in personality development and neurotic deviations and felt that in creating such disturbances and deviations society was failing to accomplish its chief objective and should, therefore, be completely reorganized" (p. 110).

*The Anatomy of Melancholy* is an egregious testimonial, a many-tongued witness, to the widespread, enduring and profound appreciation of the relationship of psyche and soma in health and disease. Yet nowhere in this Cento is the term psycho-somatic to be found, nor any other term or phrase that is precisely the equivalent of the "hyphenated expression." That is to be expected, for psychosomatic—like its barbarous plural substantive psychosomatics—is a strictly modern term, hardly "old enough to vote".

There is nothing in the vernacular of antecedent medicine that can be construed as the homologue of psychosomatic. Robert Whytt in 1765 used the term "nervous" to cover a multitude of diagnostic ignorances, and George M. Brand in 1868 coined the term *neurasthenia* to describe the syndrome of "nervous exhaustion". Psychosomatic medicine was launched less than 20 years ago, to be precise, in 1935, when Dunbar's *Emotions and Bodily Changes* was first published.

This historical datum is as interesting as it is challenging. There is nothing novel in the terms *psyche* and *soma*. They are as ancient as the Greek tongue. They are not used in a novel manner, as for example is the term cybernetics. They are merely ligated by a hyphen, or coalesced into a single term. Is it not proper then to ask precisely why we were obliged to wait till the year 1935 before *that* hyphenated term was coined, and again, why it has since acquired such wide currency? For as Grinker properly affirms: "Within little more than a decade, the term 'psychosomatic medicine' has become an integral part of the vocabularies of most physicians and many informed laymen."<sup>3</sup> Surely all this is not consequent on some phenomenal discovery like that, say of the antibiotics. The reciprocal relation of psyche and soma, as we have already noted, was amply appreciated throughout the long span of antecedent medical history. Even in the more specific sense of the effects of the emotions upon physiology,

there was available for our instruction the remarkable and original work of William Beaumont, and even the more artful and relevant studies of Claude Bernard. The sudden upsurge of psychosomatic medicine we can therefore account for only as the result of some abrupt conceptual transmutation, some sudden conversion in thinking pattern, some radical change in ideational *gestalt*.

The ancients and their heritors, down to the beginning of the 17th century fully appreciated the reciprocal relation of mind and body—of psyche and soma. But they had no grasp, nor were they required to have one of the hyphenated, dichotomous term psychosomatic. I suspect that had they been confronted with such a term, they would have found it bewildering, paradoxical, alien to their understanding, and disconcerting. For the ancients and their followers did not split psyche from soma. This dichotomy was an achievement of the Era of Enlightenment, and is to be credited especially to René Descartes. Let there be no mistaking of this basic fact: the term psychosomatic was coined in the attempt to mend the dichotomy of psyche and soma. It was inconceivable *before the event*—before in other words psyche and soma were in effect rent asunder. Frederick Lange in his classical *History of Materialism*<sup>4</sup> observes that it was Descartes "who established the dualism between mind and material world." (p. 241).

"Although . . . Materialism starts with Bacon," Lange wrote, "it was nevertheless Descartes who finally impressed upon this whole way of thinking that stamp of mechanism which appears most strikingly in De la Mettrie's *L'Homme Machine*. It was really due to Descartes that all functions as well of intellectual as of physical life were finally regarded as the products of mechanical changes" (p. 243).

Descartes affirmed the existence of the soul, the psyche, and even assigned to it a specific site—the pineal gland. But following upon his epochal works the world of science and intellect was much more preoccupied with the human machine, with the anatomic and physiologic mechanism, than with the psyche.

It is not at all mystifying, as Evans seems to find it, that after the 8th edition of Burton's *Anatomy* appeared in 1676, the work began to decline. A hundred years later the *Anatomy* was so little read, even by the literate and learned that Lawrence Sterne could incorporate in his Tristram Shandy<sup>5</sup> long passages lifted from Burton, and remain undetected, nay even receive



applause for just those passages which he had purloined.

The fact was that the mood of the learned world had been deeply affected by Descartes and the Cartesians: The learned world had little patience with, indeed a great deal of contempt for, what it termed the foggy philosophy of the Ancients. The future was with the Experimentors, the past with the dead.

The history of psychiatry mirrors the change and the mood. Henceforth the "mechanists", that is the neuro-anatomists and the neuro-physiologists commanded the esteem and the attention of the world of learning. Those who were preoccupied with the psyche—with the soul—were disdained and even pilloried. They were the Paracelsians, the Mesmerists, the vitalists: men deemed to be charlatans, crackpots, or at best peripheral intellects. Need I to call in witness the dismal history of Mesmer, and of Mesmerism, or to remind you how very obtuse and blind the confraternity of the learned proved in the presence of the most patent demonstrations of the effect of the psyche upon the soma. The most illustrious of scientific bodies in Europe, The French Academy of Science, reluctantly investigated the phenomenon of Mesmerism, and then dismissed it with the aphoristic dictum "L'imagination fait tout; le magnetisme nul". Benjamin Franklin, who was a member of the investigating Commission of the Academy, had no difficulty in conceiving the transmission of an electric potential along a kite string. That was a physical phenomenon! But, the imagination—that was quite a different matter, smattering of scholasticism, and Aristotelian metaphysics.

It is most instructive to trace the vicarious transmission, propagation, and elaboration of the Mesmerian idea, which, purged of its magnetism factor, became the pristine issue of the influence of the psyche upon the soma, and of course by corollary, of the reverse as well. Most impressive is the fact that it could not be downed either by persecution, legal and ecclesiastic, or by ridicule. It could not be vitiated, nor fatally corrupted by charlatanism or error. Repeatedly it would revive and phoenix-wise rise again to stir the inquisitive minds of the best of men. In the chronicles of Mesmerism, hypnotism, and suggestion, as the issue of psyche and soma, was successively labelled, there are emblazoned the names of a host of courageous, redoubted, ingenious, and original souls.

I will count but a few, the French Marquis de Puységur, the Italian Abbé Faria, the English surgeons Braid, Elliotson, and Esdaile-Liebault and Bernheim, the French clinician and neurologist Charcot, and the Austrian—Sigmund Freud, for he is in effect a lineal descendant of Mesmer, and like him suffered the opprobrium attendant on the preoccupation with the psyche in the realm of modern medicine.

It was felicitous but not accidental that Freud named his discipline psychoanalysis and not mind analysis, for the genius of Freud, by its intuent intelligence, early grasped the crucial issue and set the psyche in a differential apposition, not to the soma, but precisely against the mind. In that he gained the ultimate insight which Pierre Janet, still hobbled by Cartesian formulations, only dimly discerned.

I am quite certain that were it not for Freud and his psychoanalysis, there would have been no psychosomatic medicine. I do not thereby intend to pronounce myself a follower of "the great man school" of historical determinism. On the contrary, I hold that had Sigmund Freud missed his appointment with the stork, another Freud would have issued to earn the honour. For so far as we can comprehend, the occasion and the event, quite like the Canadian Mounties, always "get their man". But in the framework of the historical actuality it was Freud, who in his psychoanalysis taught contemporary medicine, and the world beside, to appreciate the enormous dynamic potentials and operational *vis* of the psyche. However, I find it difficult to count Freud among the pioneers of psychosomatic medicine, even though I know that others do. For though psychoanalytic ideation enters into psychosomatic medicine, the movement as such, for a movement it is, drew its initial momentum not from psychoanalytic insight but from what I would term epidemiological necessity.

This is a matter which deserves close scrutiny. Recall that the psychosomatic movement was initiated, according to its historians, with the publication in 1935 of Dunbar's now classical volume.<sup>6</sup> The journal *Psychosomatic Medicine* was established four years later, *i.e.*, in 1939. Yet, as we have observed, the appreciation of the reciprocal bearings of the psyche to soma, in modern medicine, dates back to at least the beginnings of the nineteenth century. Henry Bunker, in his essay "Psychiatry as a Specialty"<sup>7</sup> cites a host of American psychiatric pioneers

who knew full well that "in a majority of cases dyspepsia is primarily a disease of the brain and nervous system" (p. 500), and that "inward sorrow was the true origin of many maladies." I have already mentioned the works of William Beaumont and of Claude Bernard. Walter B. Cannon published his *Bodily Changes in Pain, Hunger, Fear and Rage*, in 1915, and his *The Wisdom of the Body* in 1932. The academic, purely theoretical terrain, as may be seen from all this, had been plowed and harrowed for more than a century: the seed had been sown many decades ago—yet psychosomatic medicine itself sprouted only in 1935. Why the long delay?

I have already committed myself on that score. It was epidemiological necessity rather than psychoanalytic or psychiatric insight that initiated and motivated the psychosomatic movement. But here I must hasten to explain what I mean by epidemiological necessity. Crudely expressed, I mean those radical changes in morbidity and mortality incidence experienced during the first quarter of the current century.

When Osler published his monumental *Principles and Practice of Medicine* in 1892, the bulk of that text was devoted to the infectious diseases, and outstanding among them as causes of death, and as the sources of innumerable other morbidities and complications, were typhoid, pneumonia, tuberculosis, diphtheria, scarlet fever, and the infantile diarrhoeas. These were, so to say, the staples—the everyday pre-occupations, the "bread, butter, and the jam", of medical practice. But by the time, as the poets would phrase it, the first quarter of the twentieth century had been unravelled from the interminable skein of time, typhoid had become a rarity, diphtheria had been robbed of its terror, tuberculosis had been substantially curbed, the infantile diarrhoeas had been eliminated. Indeed the infectious diseases had been, if not conquered, at least much restricted and weakened in their morbid effects by the combination of personal and communal hygiene, active and passive immunization, and chemotherapy. All this had an extraordinary effect upon the practice of medicine. The "staples of time past" were no more, and the physician was now confronted with a new type of case, a new order of morbidity; the sick man and the ailing woman who had "nothing the matter with them", and yet, were not well. A tonic and the well intoned and well intended advice that it was "all in the

mind" and "you'd better forget it", did not seem to work, at least not for long. What was even more discomforting, unlike the typhoid patient who either got well or died, but didn't remain "a typhoid case *ad infinitum*", the newer type of case, later so miserably named the psychosomatics, was pestiferously chronic.

If you will trouble to scan the medical literature from about 1914 on, you will, I am sure, be impressed by the number of communications published reporting on dyspepsias, cardiac disturbances, pelvic pains, and the like, which the communicants initially suspected were due to organic disease and for which they found no constitutional or physiological warrant. The surgeons too reported, at times with outraged indignation, on cases which so to say "tricked" them into the excision of perfectly good tissues and organs.

In the presence of such experience it became urgently necessary to arrive at some order of explanation—to find some suitable and competent etiological factor, to account for the otherwise seemingly unaccountable morbidities. The *psyche* pre-eminently suited and filled this need, and psychosomatic thus formed a happy union of terms which in a simple way served to render comprehensible a pathology, in which the psyche takes its place with other morbid agents, such as the bacilli, and viruses, as an etiological agent of disease.

While this is historically precisely what *did* happen, I am sure that the tale told as I tell it will sound to many like a distorting caricature, a burlesque on the actual event. We should like to think of it otherwise: we prefer to conceive of psychosomatic medicine as "the blossoming of the holistic idea", and the psychosomatic movement as an impulsion toward the recognition that the personality of the individual and his illness are but different aspects of the same psychobiological unit. Perhaps some day we may achieve that vision. Historically, the component underscored in psychosomatic medicine was, as it largely is today the *psychogenesis* of disease, i.e. of the *psyche as a morbid agent*. Thus, Bunker, after paying homage to the general idea of psychosomatic medicine as concerned "not only with disease itself, but with the psychological and characterological setting in which it occurs," proceeds to get down to concrete issues.

"More specifically," he writes, "the key question involved might be said to be that of 'psychogenesis'. That is, (he continues), can psychological factors give rise to



'organic' disease? May they have a place in the chain of causative events which lead to 'organic' disease? If so to what extent is this true, and what are the psychological factors thus involved?" (p. 500).

Admittedly this is an elementary version of the key question. It was published in 1944. Since then the question has been amplified, elaborated and fractionated. Hans Selye's contributions and those of Harold Wolff and his associates are witness thereof. But even so, as Grinker has so brilliantly demonstrated in his recently published book *Psychosomatic Research*,<sup>8</sup> psychosomatic medicine has not as yet extricated itself from the quagmire of Cartesian philosophy, which first split psyche from soma, and made of them a "dichotomy". It is here that I must cite Zilboorg's felicitous dictum: "That which is divided in principle cannot become united by a mere artifice in spelling." (p. 725 *Modern Trends in Abnormal Psychology*, W. H. Mikesell, edit. Philosophical Library, 1950).

I cannot, for time will not allow, nor is it entirely pertinent to the subject, elaborate on "the quagmire of Cartesian philosophy". I must, however, touch on two fallacies which vitiate much of the results of research in psychosomatic medicine, and which as long as they prevail, will render nugatory all efforts to make of psychosomatic medicine a holistic discipline. The first fallacy I can only mention. It lies in the naïve understanding of causality. Bertrand Russell wrote an excellent essay on this, which, were it in my power, I would make obligatory reading for every research worker and particularly for the psychosomaticist. The other fallacy revolves about the misconception as to what we can learn from the study of disease in general, and from pathology in particular. Claude Bernard<sup>9</sup> wrote wisely on these scores. The basic fact is that pathology only crudely mirrors etiology, and from a study of morbid results one can gather only vague and generalized ideas of the antecedent events. The living organisms, be it a cell or an animal, has only a limited number of ways in which it can react to injury, but the injurious agents are infinite in number and are capable of innumerable combinations. It is a thesis which I can here pronounce but neither elaborate nor defend, that normal and experimental physiology is a far better teacher than pathology.

My assignment was to trace the roots of psychosomatic medicine, not to delineate its

trunk and branches, nor to project how it will grow further. Yet I cannot forego touching on the contemporary scene, nor casting, be it ever so furtive, a glance upon the future. However, I can be brief, for Grinker, whose recent work I have already mentioned, has dealt amply and ably with both. Insofar as psychosomatic research is physiologically oriented, it cannot but be of value, provided of course that it confines itself to reporting its findings as data observed, and not as causality relations demonstrated. Typological studies I am persuaded are most prone to mislead and to corrupt our understanding. I disbelieve the existence of a pure and fixed hypertension type, ulcer type, etc. I am persuaded that a change in the ecological setting of a so-called "type person" would result, assuming he remained in disharmony with his world, in a different form of psychosomatic disorder. I agree with Grinker that "a particular psychosomatic expression is not constantly related to a specific emotional constellation" (p. 66).

Some time ago, in a moment of rash frankness I spoke out against the use of the term psychosomatic. I objected to it because in the very effort to mend the dichotomy of psyche and soma it perpetuates the division. I offered in its place the term eubiotic medicine. At this time I hold no brief for this term, nor am I moved to re-endorse the protest against psychosomatic. Terms *do* matter, but what matters even more is understanding. And I am persuaded that by the labours, in part at least, of those who are working in the field of psychosomatic medicine, we will in time arrive at an understanding of man as a congelation of time- and space-bound matter suspended between the eternity of the past and the eternity of the future. We will learn to understand the experiences of man in terms of multidirectional relations, and with a simultaneity that is free of the naïveté and artificiality of straight line sequential causality. We will then not seek to fathom "whether and how an anxiety may engender an ulcer, or an ulcer an anxiety," but will rather grasp at once that ulcer and anxiety are but two of the infinite tangents along which *that* person's malignant relation to his world can be witnessed. We may even comprehend that such malignancy may derive as well from the individual's world as from *his* relation to his world. When we have come to such an understanding, psychosomatic medicine will be truly holistic. But then, may I whisper it

softly, it will no longer be psychosomatic medicine. It will be medicine such as Hippocrates could comprehend, and Paracelsus might celebrate—a keen reflection on the interrelations of Microcosm and Macrocosm. It will be what I would term—the highest order of Social Medicine.

## REFERENCES

1. OSLER, W.: *Creators, Transmuters, and Transmitters*, as illustrated by Shakespeare, Bacon, and Burton. Remarks made at the opening of the Bodley Shakespeare Exhibition, April 24, 1916 p. 2, 3.
2. EVANS, B.: Columbia University Press, N.Y., 1944.
3. GRINKER, R. R.: *Psychosomatic Research*, W. W. Norton & Co., Inc., New York, p. 13, 1953.
4. LANGE, F.: *History of Materialism*, Harcourt Brace & Co., New York, 1925.
5. *Vide* Paul Jordan-Smith: *Bibliographia Burtoniana*, Stanford University Press, Stanford University, California, 1931, p. 107.
6. DUNBAR, F.: *Emotions and Bodily Changes*, Columbia University, New York, 1935.
7. BUNKER, H. A.: *American Psychiatry as a Specialty, in One Hundred Years of American Psychiatry*, ed. by J. K. Hall, M.D., Gregory Zilboorg, M.D., Henry Alden Bunker, M.D., pp. 479-505.
8. GRINKER, R. R.: *Psychosomatic Research*, W. W. Norton & Co., N.Y., 1953.
9. *Vide* *Principes de médecine expérimentale*, re-published Paris, 1947.

### THE PROBLEM OF MAMMARY CARCINOMA\*

NORMAN C. DELARUE, M.D., *Toronto*

MAMMARY CARCINOMA presents a challenge to the medical profession today possibly unequalled by that found in considering any other malignant neoplasm of common occurrence. The challenge exists not only because this disease is one of the most frequently encountered causes of death in women between the ages of 30 and 75, but also because the standard methods of surgical treatment have effected such little improvement in the survival rates of patients treated by these means. Whereas untreated patients show a five year survival in approximately 22% of the cases, the best results obtained by radical mastectomy in skilled hands and in the treatment of selected cases, shows only a five year survival of about 30%. This whole problem has recently been brought most emphatically to the attention of physicians and surgeons alike as a result of statistical evaluations claiming to demonstrate in the first place the failure of therapy to influence survivorship, and in the second place the unimportance of stressing early diagnosis in so far as it may influence the end results obtained by treatment.

It is important therefore, first in this discussion to decide whether the publications dealing with the complete failure of treatment to influence survival are valid and that this thesis has been proved without reasonable doubt. Although there has been no apparent fall in the age-specific death rates due to carcinoma of the breast, one

encounters at once in considering this problem, factors which tend to diminish the significance of this fundamental statistical observation. The increasing frequency with which carcinoma of the breast occurs is not purely a product of increased longevity but also the natural outcome of better and more accurate diagnosis both by the lay population and the medical profession as a whole, so that an appreciably greater number of cases are encountered in each age group from which deaths may occur. In addition it is regrettably true that death certification embodies errors in correct appraisal of the cause of death, in that it is a frequent practice for the physician to attribute death to mammary cancer in any patient who has suffered from this disease, whereas some completely unrelated condition might have actually been responsible for the death. Both these factors affect the ready clinical acceptance of this purely statistical observation, which one would feel to be as yet unproved.

In considering the value of early diagnosis a similar clinical argument exists that tends to disprove the thesis that early diagnosis is not an important factor in affecting the prognosis. Park and Lees<sup>1</sup> in their assessment of this proposition, argue that because 60% of patients have involved nodes in the axilla at the time of diagnosis (with a resultant drop in the five year survival from 70% in patients without nodes to 20% in this group) whereas there is only an insignificant increase in involvement to 75% at the end of three years, the factor of delay cannot be of any great significance. This may of course be perfectly true if patients are grouped in stages, for the patient whose disease remains clinically in a certain stage at the end of three years, has a type of disease that is biologically relatively inactive when compared to a patient whose disease has

\*Paper presented at the 46th annual Meeting of the Saskatchewan Division of the Canadian Medical Association, Lake Wasesiu, Sask., August 26, 1953 under the auspices of the Saskatchewan Division of the Canadian Cancer Society.



reached that stage within a few months, with the consequence that the survival may be at least as good or possibly better than in the patient with more malignant disease who seeks attention earlier. Nonetheless as Kraus<sup>2</sup> has pointed out, were all patients to wait three years before seeking advice, not only would 75% have involved axillary nodes, but many of the biologically active neoplasms would have already produced death so that the outcome in the entire group would actually be far less favourable and the incidence of metastases far greater.

Despite the fact too that the more malignant cases seek attention at an earlier date, due presumably to the adverse effect of the presence of metastases on the patient's general condition, there is still ample evidence that series of cases in which early treatment is compared to late treatment in the same medical centre, show a uniform improvement in survivorship when early treatment is instituted. Eggers<sup>2</sup> has reported a five year survival of 76% with delay less than one month between clinical recognition of the disease and the institution of therapy as compared to a 20% survival with a delay of two years or longer. Haagenson<sup>2</sup> quotes similar figures showing a 54% five year survival with treatment within two weeks and only a 22% survival when treatment is delayed two to three years. Geschickter<sup>2</sup> demonstrates a comparable improvement in both circumscribed and infiltrating carcinoma and Shimkin<sup>3</sup> suggests that when delay in initiating treatment is less than one month only 48% of patients have axillary metastases with a survival, even in this group, of 60% because of the absence of generalized metastases at this stage in the disease.

This latter assumption, that there is a period in which axillary metastases alone may occur before the development of generalized hæmatogenous spread, is supported by many reports indicating five year survivals in cases of this type of better than 20%. As Kraus also points out, the fact that Harrington<sup>4</sup> is able to report on survivals in successive five year periods in which there is never less than 20% survival and in which the survival rates show a progressive improvement with each successive period, signifies that this change must represent the effects of improved and earlier therapy. Shields Warren<sup>5</sup> in a similar vein also demonstrated many years ago, a decrease in curability and survivorship as the extent of axillary involvement increased.

It would seem therefore that there is no reasonable doubt that treatment, preferably delivered at an early stage, does in fact influence favourably the results obtained. This improvement is most logically based on the supposition that the extent of the disease (including both the size of the primary neoplasm and the presence of metastases) is dependent not only upon the biological properties of the tumour, important as this fact undoubtedly is, but also upon the length of time the tumour has been present. Therefore early diagnosis and treatment remain of fundamental importance in any attempt to improve the results of therapy no matter what type of treatment is to be utilized subsequently.

Nonetheless, despite the apparent efficiency of a radical mastectomy as a "cancer operation", combining as it does a wide removal of the primary lesion with a direct anatomical dissection of the regional lymphatic drainage area in the axilla, there can be little argument with the thesis that this single method of surgical approach to the problem has failed to dramatically influence the prognosis in any but the earliest stages of the disease. Consequently the challenge to be faced involves two phases, firstly the attempt to develop an effective method of treatment (particularly one applicable to locally advanced disease) and secondly the necessity of proving that the treatment devised does actually improve the prognosis in these patients, not only in regard to actual survivorship but also the ability of the therapy to maintain the subject free of disease either of residual or recurrent type.

It is at once obvious that victims of the disease die despite radical surgical therapy, because the disease has already spread by direct extension or by hæmatogenous or lymphatic channels, beyond the extent of the dissection, or else it is spread as a result of the actual surgical trauma itself.

#### FACTORS RESPONSIBLE FOR FATAL OUTCOME

(a) If hæmatogenous metastases are already present, removal of the primary lesion can only affect the end result by making the patient more comfortable physically and mentally and will not increase the life span appreciably, although treatment of the metastatic areas directly may do so.

(b) If lymphatic metastases are present in regional lymph nodes, other than those included in the axillary dissection, it is not quite so definite

that treatment of these areas concurrent with the local surgical attack, may not affect the end result favourably. It is possible and probable, that a similar lag period occurs, as in the case of axillary metastases, when the disease is confined to the regional nodes and before further dissemination occurs to distant organs so that treatment at this period may result in eradication or control of the disease process. The nodal areas affected are the internal mammary chain and the supraclavicular nodes, with a percentage involvement to the best of our present knowledge, of approximately 50% in the internal mammary chain and 33% in the supraclavicular area when the axillary nodes are involved. In the overall picture two-thirds of the patients with axillary involvement will have nodal metastases in either one or the other of these regional zones. Even in the absence of axillary spread the internal mammary chain may be involved in better than 10% of patients. Neither of these areas are the site of the metastases responsible for death but if they remain there is a source for distant emboli which will sooner or later affect vital organs and result in a fatal termination.

(c) If the disease process has spread by direct extension beyond the local dissection, then of course local recurrences may be expected to develop rapidly as was true when simple mastectomy was the only treatment known for breast cancer, in which event recurrences were reported as occurring in 60 to 80% of the cases. The radical operation alone with its wider removal of skin, breast tissue and local lymphatic plexuses, particularly those on the fascial plane, produced a dramatic reduction in this figure to approximately 10% in skilled hands. In addition to the danger of limited dissection, there is the possibility that the surgical procedure may entail manipulation and division of permeated lymphatic channels. This may free emboli capable of setting up local recurrences, or more importantly, in keeping with the experimental observation<sup>6</sup> that increased tissue tension, particularly that associated with digital pressure, favours embolization, distant metastases may result from the surgical manipulation. Some observers have felt this factor to be of practical as well as theoretical importance in dealing with the axillary disease that is so frequently present and the extent of which it is so difficult to delineate accurately on clinical or surgical assessment.

#### METHODS UTILIZED IN ATTEMPTING TO CONTROL THE FACTORS RESPONSIBLE FOR DEATH

With these various factors in mind, attempts to improve the results of treatment have been made along several divergent pathways.

(a) If hæmatogenous metastases are present all are agreed that treatment should be merely palliative with removal of the primary neoplasm only if a massive secondarily infected tumour is undermining the patient's general condition and thought to be accelerating the eventual outcome as well as representing a troublesome physical and psychological hazard. Palliative therapy of course, may be given effectively in some cases to metastatic areas accessible to therapy if they are producing debilitating symptoms.

(b) In attacking regional lymphatic involvement in the supraclavicular and internal mammary fields, Wangenstein<sup>7</sup> has attempted by a "super radical" operation to remove these areas surgically and Urban,<sup>8</sup> as well as others, have designed procedures to remove portions of the internal mammary chain as part of the block dissection of the radical mastectomy procedure. Goode<sup>9</sup> has dealt with the problem by placing radium needles in the upper four intercostal spaces at the time of operation as well as utilizing regular methods of delivering radiotherapy.

It has been our feeling that the accurate delineation of the disease in the internal mammary area, which is usually of microscopic extent, is more difficult than a similar surgical appraisal of the axilla, long recognized as a difficult if not impossible procedure and consequently it has not been felt that the addition of this major procedure offers sufficient assurance of total eradication of the metastases to warrant its use. We have nonetheless been impressed that therapy should be delivered to these areas of involvement and have been attracted by the potentiality of effecting control by high voltage radiotherapy. Richards<sup>10</sup> previously reported a 50% five year control in patients with clinically involved supraclavicular nodes and because the internal mammary chain which is anatomically constant in position (no more than 1 inch from the mid-line or 1 inch in depth from the surface) is accessible to a similar radiotherapeutic attack, high voltage radiotherapy has been utilized in an attempt to control any neoplastic deposits in this region. Probably of greater importance is the attempt to prevent subsequent liberation of emboli,



capable of setting up metastatic deposits in vital organs, as a result of the lymphatic occlusion brought about by the peri-lymphatic scarring that results from the radiation reaction.

(c) In assessing the dangers of surgical procedures in the presence of local extension of the neoplasm, either at its primary site or in association with axillary metastases, several authors have outlined radically different attempts to avoid these dangers and thus improve the results. It was apparent to early investigators that more complete removal of the primary lesion would be possible if one deliberately planned a wide skin excision and accepted as a routine part of the operation the necessity of utilizing a skin graft in order to obtain wound closure. Although theoretically the wider the local excision the less frequent should be the development of local recurrences, the practical application of this principle did not result in the expected improvement, because it was commonly reserved for the treatment of those cases in which the local disease was already of gross local extent, thus favouring postoperative recurrence whether due to operative trauma or residual disease. In addition it very soon became apparent also that the patient did not succumb to these local exhibitions of the disease but to distant metastases not affected by this purely localized attack on the problem. Consequently the routine use of skin grafting has not had a wide acceptance.

In analyzing the results of therapy at the Presbyterian Hospital, Haagenson and Stout<sup>11</sup> discovered a group of patients with evidences of locally advanced disease in whom it was not possible to obtain five year survivals by conventional methods of management. These evidences of locally advanced disease were represented in the breast by extensive oedema of the skin over the breast, inflammatory carcinoma, satellite nodules over the skin of the breast, or a combination of any two or more of the following signs: ulceration of the skin, oedema of less than 1/3 of the skin over the breast, fixation of the tumour to the chest wall and involved axillary nodes larger than 2.5 cm. in diameter or fixed to skin or deeper structures. In the regional lymphatic areas these evidences of locally advanced disease were demonstrated by oedema of the arm, supraclavicular metastases or intercostal or parasternal nodules. These patients with the additional cases in whom distant metastases were present or in whom the disease developed in con-

junction with pregnancy or lactation, were considered as "categorically inoperable", and with the exclusion of such cases the results of treatment by radical mastectomy were improved by dealing only with the remaining more favourable types of the disease. This approach to the problem as previously noted resulted in an increase in the five year survival from approximately 33% to 50% in the patients so treated. One must emphasize however, the fact that in meeting the challenge in this way the authors have denied patients with advanced disease any opportunity for survival.

When considering the potential dangers of increased tissue tension and particularly that produced by digital pressure, Haagenson has also attempted to demonstrate an increasing five year survival rate in direct proportion to the care and length of time taken to perform the operation with attention to knife dissection throughout and avoidance at all times of rough handling or undue traction.

McWhirter<sup>12</sup> on the other hand, has stressed the dangers of radical dissection in the presence of axillary lymphatic involvement on the basis that the manipulation may result, as is the case of locally advanced disease confined to the breast, in the liberation of emboli capable of distant dissemination. He has chosen therefore to deal with all "operable" cases by performing a simple mastectomy and then to follow the surgical procedure with a direct radiotherapeutic attack on the three regional lymphatic drainage fields. This combination of surgery and radiotherapy has the advantages of technical simplicity, negligible mortality, diminished postoperative wound morbidity and almost complete absence of arm swelling or limitation of shoulder motion. Nonetheless despite the fact that the results obtained in this experiment (five year survival in 42%; ten year survival in 25%) show a definite improvement when compared with results of radical mastectomy and postoperative irradiation in the same centre, (five year survival in 31%; ten year survival in 18%) there are definite objections to a general acceptance of this combined therapy that cannot be overlooked. In the first place McWhirter reports only absolute survival, without publication of "cure rates", in order to exclude any personal element in the statistical evaluation, and although this may be ideal in the purely statistical sense, one cannot but wonder whether an appreciable per-

centage of patients are surviving with residual or recurrent disease that is clinically apparent.

On purely theoretical grounds one would expect an increased incidence of local recurrence with the relatively limited skin excision, the possibility of peripheral breast tissue remaining in the surrounding subcutaneous tissue, the thicker skin flaps commonly prepared in this type of dissection and the fact that no attempt is made to remove the lymphatic plexus on the fascial plane. Of possible importance in considering this point is the reported incidence of local recurrence in the same centre of 39% even when radical mastectomy is the surgical procedure chosen, certainly a figure considerably higher than that generally reported elsewhere, although more rigid exclusion of more advanced tumours may explain in some part the difference. It is interesting to note also, that when comparable amounts of preoperative radiotherapy have been given we have encountered in our own series a local recurrence rate of 23% when simple mastectomy only is performed whereas the rate was only 6% when a radical operation was subsequently the surgical procedure utilized, a difference difficult to explain wholly on the increase in local extent of the disease in the patients treated by simple mastectomy. In the second place approximately 60% of patients coming for treatment will have already developed axillary metastases and if these cases are treated by radical mastectomy five year survivals may be expected in better than 30%. Because axillary sterilization with maximum dosage of preoperative irradiation is demonstrated pathologically in less than 50% of patients with axillary involvement<sup>18</sup> one would estimate that less than half of this group of potential survivors would do as well were one to rely only on high voltage radiotherapy in attempting to control the axillary spread, a risk, which on the evidence presently available, we are not prepared to accept.

With these objections in mind, while fully appreciating the dangers of manipulating involved lymphatic channels, it was felt that a preferable approach to the problem of controlling this danger could be made by planning a preoperative obstruction of the lymphatic channels along which emboli released by manipulation would travel to distant sites. Consequently by delivering high voltage radiotherapy in maximum doses preoperatively it was hoped that the radiation reaction would be associated

with sufficient perilymphatic fibrosis to produce on scar contracture, obliteration of the affected vessels. In this way it would then be possible to carry out a complete axillary dissection without danger, in the hope of salvaging those cases in whom the disease had not yet spread to more distant organs. Of interest in this regard too, is the widespread observation that axillary recurrences, even when radical surgery alone is performed, developed in less than 5% of the patients subjected to axillary dissection.

#### THE USE OF PREOPERATIVE RADIATION IN CONJUNCTION WITH RADICAL MASTECTOMY

In summarizing the above discussion it becomes at once apparent that there are obvious theoretical advantages to be obtained by the use of radiation preoperatively. These and certain other factors may be enumerated as follows:

(1) High voltage radiotherapy is capable of producing necrosis of the malignant cell. This is particularly true in the case of those cells undergoing rapid mitosis, as the therapy attacks the cell during certain phases of the mitotic process. It is interesting to note that Smith<sup>14</sup> has demonstrated a practical application of this principle in reporting that x-ray treatment is effective in prolonging life particularly in patients with grade 3 neoplasms whether nodal involvement was present or not. (2) The post-radiation fibrosis diminishes the danger of spreading disease in three ways: the interstitial fibrosis limits local extension, the perilymphatic scarring minimizes the possibility of lymphatic embolism and the perivascular scar diminishes the blood supply to the malignant cell thus lowering its invasive vitality. (3) Radiation therapy can be applied more effectively with the prominence of the involved breast allowing greater local dosage of radiation delivered by tangential beam. In addition a higher tumour dosage is possible when the area treated has not been previously traumatized by surgical procedures. (4) Cells whose blood supply have not been altered by operation are more susceptible to radiation therapy. (5) Tissue generally is less receptive to implantation after radiation. (6) Any cells disseminated by surgical manipulation may be incapable of setting up a metastatic focus due to their diminished vitality. (7) A fixed lesion occasionally becomes movable thus allowing surgical excision. (8) Treatment may begin immediately, a factor of increasing importance with the present scarcity



of hospital beds and the resultant delay often encountered in arranging admission to hospital for treatment. (9) Treatment is available for patients who refuse surgical excision.

These possible advantages have been recognized for many years but surgeons generally have been loath to attempt radical surgical procedures in a field that had been extensively irradiated because of technical disadvantages that were thought to make subsequent operation too hazardous. The disadvantages described included the technical problem presented by the post-radiation x-ray fibrosis and also the possible delay in wound healing with the danger of tension necessitating more frequent use of skin grafting, and the hazard of infection representing a complication to be dreaded in a relatively avascular field. It was felt too that the combined treatment would be associated with an increasing incidence of shoulder stiffness and oedema of the arm, postoperative complications already too frequently encountered. The length of treatment necessary and the nursing problem presented by extensive skin changes were additional factors that discouraged more widespread adoption of this principle. However after an experience with this plan of therapy extending now over a period of 20 years, it is possible to state unequivocally that the dangers of operating in an irradiated field have been greatly over-emphasized in the past. Provided one waits until the acute radiation reaction has subsided (usually five to seven weeks after completing the therapy) there is no significant increase in lymphoedema of the arm or in limitation of shoulder motion and statistically wound healing is not adversely affected, unless infection is present or tension on the wound edges permitted. It is imperative of course that one should not attempt surgical operation in the immediate post-radiation period when the inflammatory vascular reaction is at its peak or catastrophes will surely occur. The delay period noted above is essential and must not be disregarded.

As intimated throughout this discussion the use of preoperative radiotherapy in conjunction with radical mastectomy has been designed in an attempt to improve the results of treatment in those patients unfortunate enough to demonstrate locally advanced disease when first seen in consultation. As such the philosophy underlying this approach to the problem must be stressed, implying as it does an attack using both

methods of therapy as fully as possible. Radiation therapy is given then in maximum cancerocidal dosage, attempting to deliver between 4,200 and 4,500 Roentgen units to every part of the breast, chest wall and nodal areas treated within a period of two to two and a half weeks for each area. It is felt that smaller or token dosages have no place in a therapeutic program of this type. The subsequent mastectomy is of the standard radical type for the reasons outlined previously.

In the determination of locally advanced disease it has been found profitable to depend upon a classification previously described<sup>16</sup> which has been based for simplicity on two prominent descriptive features of the local breast lesion. The first of these features described under the general term of "retraction phenomena" denotes the host reaction to the presence of malignant cells and is produced by the development of fibrous tissue in an attempt on the part of the host to localize the neoplastic lesion, thus preventing its local extension and diminishing the possibility of distant lymphatic or hæmatogenous dissemination. These signs will be most apparent of course in lesions lying adjacent to skin or deep fascia where contracting scar with attachment of the lesion to skin or fascia results in the changes enumerated below.

#### RETRACTION PHENOMENA

*Superficial changes.*—Dimpling of skin: if not obvious this may be demonstrated by: approximation of fingers, elevation of arm above head, elevation of breast, contraction of pectoralis major.

Nipple alteration: retraction, deviation.

*Deep changes.*—Attachment of tumour to deeper structures: limitation of mobility on contraction of pectoralis major, actual movement of tumour on contraction of pectoralis major.

The second of these features appears when the lesion transgresses the bounds of the reactive fibrosis and begins to invade the local tissues by direct extension involving in its progress not only the skin and deeper structures but also the local lymphatic plexuses by permeation with the ever-present danger of distant embolism. The signs of this neoplastic invasion are enumerated as follows.

## INVASION PHENOMENA

*Superficial changes.*—Alteration of skin, ulceration, peau d'orange, brawny œdema (inflammatory carcinoma), satellite nodules.

Nipple alteration; Paget's disease.

*Deep changes.*—Fixation of tumour to deeper structures, lesion becomes immobile.

Lesions centrally situated, deeply within the breast tissue, may be associated with the same fibrosis or local invasiveness but clinically detectable signs of these changes do not develop so soon in the course of the disease, thus necessitating the use of the additional factor of size in the staging of these central lesions. If the tumour measures less than three centimetres in diameter it may be included in the earliest stage but as its size increases it is best to advance the staging even in the absence of other signs of advancing local disease.

On the basis of these descriptive features of the local lesion with a clinical assessment of the presence or absence of axillary involvement or of distant lymphatic or hæmogenous metastases, the following classification may be formulated.

## CLASSIFICATION OF MAMMARY CARCINOMA

Stage 1.—Breast tumour freely movable, (*i.e.*, no associated retraction or invasion phenomena). No palpable axillary lymph nodes. Tumour less than 3 centimetres in diameter.

Stage 2.—Breast tumour freely movable. Palpable freely movable axillary nodes. Tumour less than 5 to 6 centimetres in diameter.

Stage 3.—Breast tumour (or involved axillary nodes if present) demonstrates "retraction phenomena". Tumour greater than 5 to 6 centimetres in diameter.

Stage 4.—Breast tumour (or involved axillary nodes if present) demonstrates "invasion phenomena".

Stage 5.—Breast tumour or axillary nodes as in any other stage with additional evidence of distant lymphatic or hæmogenous metastases.

The validity of this staging as used to describe advancement of the local disease process is supported by the steadily diminishing five year survival rate in the first four stages in those cases treated by radical mastectomy and post-operative irradiation as reported originally by Richards<sup>10</sup> (1—81%; 2—54%; 3—38%; 4—16%). A similar diminution also becomes apparent in reporting on the results of treatment with pre-operative radiation (*vide infra*).

The multiplicity of stagings and the different methods of reporting the results of treatment in different centres makes it almost impossible to compare, in other than a very broad sense, these results. Even when an apparently identical pro-

cess of staging is utilized, the strictness of the application of the criteria on which the staging is based will produce changes in the results obtained entirely apart from the method of treatment being discussed. If, for example, the staging (Fig. 1) in centre A is more strict than in centre B there will be fewer cases in stage 1 and the staging will include only the less ad-

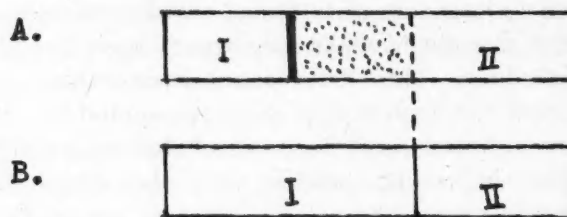


Fig. 1.—Fallacy of staging in comparison of results.

vanced cases so that the results of supposedly identical treatment will be better than that reported in stage 1 cases in centre B. Not only will this be true in stage 1, but as a result of the more strict application of the staging criteria, there will be a larger group of less advanced cases in stage 2, with a continuation of improved results through this stage into any subsequent stage that may be used.

With these points in mind then, it would seem preferable to assess the value of any particular therapy, in so far as it produces an improved survival rate, by comparing the results of treatment in a single centre, where treatment, whether it be radiotherapeutic or surgical, is as standardized as possible and the staging has been done uniformly by one person. In the results to be reported, the staging has been done throughout by Dr. Vera Peters of the Department of Radiotherapy and the radiotherapy itself carried out by one centre with the surgical procedures performed by a surgical staff trained in relatively uniform precepts. Admittedly this is not as ideal as taking alternate cases and subjecting them to different methods of treatment as a controlled experiment but it represents the most acceptable alternative and the only one available to date.

## RESULTS OF TREATMENT WITH PREOPERATIVE RADIATION FOLLOWED BY RADICAL MASTECTOMY

In the following tabulation (Table I) the results obtained by this combination of radical preoperative radiotherapy and radical surgery are presented and compared to the results obtained by using radiotherapy postoperatively as reported in a previous series.<sup>10</sup> Devised, as this



therapy has been, primarily for use in locally advanced disease, the results are most significant in the stage 4 cases where the preponderance of cases so treated are grouped. Comparing the five year survivals, it is found that 42% of these advanced cases survive as compared to but 16% when radiotherapy is delivered postoperatively. Even at the ten year period there remains an appreciable 15% salvage which is approximately twice that obtained with the use of radiation therapy after the radical mastectomy. In assessing the overall statistics, 41% of those receiving x-ray treatment preoperatively survive five years and in this group 69% of the patients were of

centages was also demonstrated in the ten year survival statistics.

With increasing experience and improvement in technique, both radiological and surgical, there has also been noted a definite improvement in successive series of both five and ten year survivals in patients in whom this combined therapy has been used.<sup>13</sup> The five year survivals show an improvement from an initial figure of 27.6% to approximately 45% in the last two five year periods analyzed and in addition the ten year survivals demonstrate an increase from 6.9% in the original period to 20.5% in the second period subjected to analysis.

TABLE I.

COMPARISON OF RESULTS OBTAINED WITH PREOPERATIVE AND POSTOPERATIVE RADIATION

Stage	Five year survival				Ten year survival			
	Preoperative		Postoperative		Preoperative		Postoperative	
	No. of cases	Gross %	No. of cases	Gross %	No. of cases	Gross %	No. of cases	Gross %
1	4	75%	147	81%	7	43%	56	59%
2			193	54%			92	28%
3			398	38%			149	21%
4	93	42%	147	16%	40	15%	45	8%
5	25	20%	36	3%	10	0	12	0
Totals:	135	41%	921	43%	57	16%	254	26%

stage 4 type with locally advanced disease and 18.5% have lymphatic metastases beyond the reach of the surgeon's knife (*e.g.* supraclavicular triangle) whereas the 43% five year survival rate

TABLE II.

IMPROVEMENT IN RESULTS OBTAINED BY USING PREOPERATIVE RADIOTHERAPY IN CONSECUTIVE FIVE YEAR PERIODS

Results	1933 - 1937		1938 - 1942		1943 - 1947	
	No. of cases	Gross %	No. of cases	Gross %	No. of cases	Gross %
Five year survival.....	29	27.6%	39	46.2%	67	44.8%
Ten year survival.....	29	6.9%	39	20.5%	Results not yet available	

in the series in which the radiotherapy was delivered postoperatively, included only 16% in this advanced local stage and but 4% of stage 5 cases. A similar significant difference in per-

Despite the fact that such a large percentage (88%) of these cases reported fall into the most advanced local stage or already have clinically apparent disease beyond the scope of the subsequent mastectomy (notably the supraclavicular triangle), the 41% five year survival compares favourably<sup>15</sup> with the reported results of other methods of attempting to improve these results as previously discussed. In these latter series the incidence of patients exhibiting such extensive disease will be much smaller, particularly when a careful selection of cases thought suitable for radical mastectomy is made. The plan of combined therapy here presented is designed specifically to extend the indications for radical treatment rather than limiting the scope of our attack on the problem and it would seem that maximum preoperative irradiation of the breast, chest wall and regional lymphatic drainage areas, followed by a standard radical mastectomy offers the best warranty of survival and freedom from disease yet reported in these advanced stages.

THE FACTOR OF AGE AS RELATED TO  
PROGNOSIS AND TREATMENT

In analyzing the survivals in the group of patients given preoperative radiotherapy, a dramatic change in the results becomes apparent when the menopausal group is separated from those in whom the disease develops prior to the onset of the menopause or else appears five years or longer after the end of the menopause.<sup>13</sup> As demonstrated in Table III, the 10% survivorship

TABLE III.

## RELATION OF AGE TO SURVIVAL IN MAMMARY CARCINOMA

Onset	No. of cases	5 year survival (Gross %)
Prior to menopause.....	24	54%
Concurrent with menopause.....	39	10%
Post-menopausal (5 years).....	72	54%
Total.....	135	41%

at this age, is completely at variance with the almost identical survival of 54% in the earlier and later age groups. This observation suggests that the disease as it develops in the young patient prior to the menopause is not necessarily more malignant nor does it have a less favourable outlook. In similar vein, Smith<sup>14</sup> has recently reported a significantly lower percentage of survivors in women between the ages of 40 and 60 and found that prophylactic ovariectomy prolonged life particularly in this very age group. Radiation castration was not as effective as surgical excision of the ovaries. With this supporting evidence and the fact that not a single patient whose disease appeared at the time of the menopause, survived the 10 year period, we feel that surgical castration should be an integral part of the therapeutic program for patients in this age group. Our statistics concerning the younger patients would not support Horsley's<sup>15</sup> contention that it should also be used routinely in women whose disease appears before the menopause. With this one additional factor to be considered in every case the following plan of treatment by stages is presented as a guide to the handling of women with disease still localized clinically to the breast and axilla.

SUGGESTED PLAN OF TREATMENT IN  
MAMMARY CARCINOMA

Stage 1.—Radical mastectomy alone. No significant improvement in the results will occur from the use of radiation preoperatively or postoperatively for in all probability the fatal outcome in patients with disease of this

type depends upon the presence of hæmatogenous metastases at the time of operation.

Stage 2.—Radical mastectomy followed by postoperative radiation upon receipt of pathological proof of axillary node involvement. Because of the very great error (30 to 55%) inherent in the clinical assessment of axillary metastases, pathological verification is advisable before subjecting the patient to radiation therapy. As the incidence of local recurrences is only 2% when radiation is given postoperatively, the use of preoperative radiation does not appear for either reason essential.

Stage 3.—It is in this stage that the treatment advised may vary. Because the previous analysis of the series given postoperative radiotherapy, showed a fall in 5 year survivals from 81% in stage 1 to 38% in this stage with an incidence of local recurrence of 12.7% (as compared to 12.3% in the preoperative series where recurrences were confined to stage 4 and 5 lesions only) one would feel that practically all these women should receive the benefit of radiation delivered preoperatively. This is thought particularly important in patients with inner quadrant lesions because 60% of these women regardless of the stage of the disease will show metastases in the internal mammary chain and even with preoperative radiation the 5 year survivals fall from 41% in the entire group to 27.6% when only medially situated lesions are considered. Possibly in small lesions in the outer quadrants especially if no obvious clinical axillary involvement is noted it may be sufficient to deliver the radiation therapy following the mastectomy but in the light of the statistics presently available even this concession may be out of order.

Stage 4.—Preoperative radiation followed by radical mastectomy is routinely advised. The diagnosis must of course be verified pathologically by aspiration biopsy performed ten days to two weeks after beginning treatment to the breast lesion. At this period the acute radiation reaction with the associated swelling of the lining cells of the lymphatic channels and the interstitial oedema that is present, add to the safety of the biopsy manipulation by the resultant occlusion of the lymphatics which makes distant embolism unlikely.

Stage 5.—Treatment is essentially palliative but often very worth while. The indications for simple mastectomy, radiation therapy, hormonal therapy or surgical alteration of the hormonal balance will be discussed in a companion article under preparation.

## SUMMARY

1. The statistical evidence that treatment of mammary carcinoma is ineffective and that early diagnosis is unimportant is open to serious doubt. Clinical observations enumerated tend to invalidate the importance of these statements.

2. Factors responsible for the poor results of radical mastectomy alone in dealing with this disease are discussed and the various attempts to improve the outlook are summarized.

3. The rationale for the use of preoperative radiation is outlined and the advantages and possible disadvantages of this program assessed with an analysis of the results obtained in locally advanced disease.

4. The importance of age and particularly the relation of onset to the menopause is stressed and the value of oöphorectomy considered.

5. The present plan of treatment advised in mammary carcinoma is briefly summarized.



6. On the basis of the results here reported it is felt that the use of preoperative radiation in locally advanced mammary carcinoma warrants more widespread consideration.

#### REFERENCES

1. PARK, W. W. AND LEES, J. C.: *Surg., Gynec. & Obst.*, 93: 129, 1951.
2. KRAUS, A. S.: *Surg., Gynec. & Obst.*, 96: 545, 1953.
3. SHIMKIN, M. B., LUCIA, E. L., STONE, R. S. AND BELL, H. G.: *Surg., Gynec. & Obst.*, 94: 645, 1952.
4. HARRINGTON, S.: *J. A. M. A.*, 148: 1007, 1952.

5. WARREN, S. AND TOMPKINS, O. H.: *Surg., Gynec. & Obst.*, 76: 327, 1943.
6. YOUNG, J. S., LUMSDEN, C. E. AND STALKER, A. L.: *J. Path. & Bact.*, 62: 313, 1950.
7. WANGENSTEEN, O. H.: *Ann. Surg.*, 130: 315, 1949.
8. URBAN, J. A.: *Cancer*, 5: 992, 1952.
9. GOODE, J. O. AND MARTIN, J. A.: *Ann. Surg.*, 137: 856, 1953.
10. RICHARDS, G. E.: *Brit. J. Radiol.*, 21: 109, 1948.
11. HAAGENSEN, C. D. AND STOUT, A. P.: *Ann. Surg.*, 134: 151, 1951.
12. MCWHIRTER, R. V.: *Brit. J. Radiol.*, 21: 599, 1948.
13. PETERS, M. V.: *J. Canad. Ass. Radiol.*, 4: 32, 1953.
14. SMITH, G. V. AND SMITH, O. W.: *Surg., Gynec. & Obst.*, 97: 508, 1953.
15. ASH, C. L., PETERS, M. V. AND DELARUE, N. C.: *Surg., Gynec. & Obst.*, 96: 509, 1953.
16. HORSLEY, G. W.: *Ann. Surg.*, 125: 703, 1947.

### OCULAR ABNORMALITIES IN POLIOMYELITIS AND THEIR PATHOGENESIS\*

ROBERT G. MURRAY, M.D.† and  
FRANK B. WALSH, M.D.‡

POLIOMYELITIS has become more of a problem to ophthalmologists during the last decade because bulbar polio has been increasing in occurrence. The increased occurrence of bulbar polio is thought to be due to the disease affecting more individuals of the older age groups. Polio is now frequently found in patients of late 'teen age and is not uncommon in the third and fourth decade of life.

This paper, for the most part, is based on the ocular involvements in cases occurring in the Baltimore area from 1950 through 1952. During this period, 516 cases were admitted to the Baltimore City Hospitals. These cases were classed as poliomyelitis only after careful screening and were so diagnosed on discharge from hospital. Certain ocular involvements which were not observed in this series of cases are described on the basis of reports in the literature.

#### PATHOLOGY

The small neurotropic polio virus affects primarily the grey matter of the central nervous system, particularly those nerve cells concerned with motor functions. It has such a peculiarly constant attraction to the nerve cell that many investigators prefer to call it neurocytotropic rather than neurotropic. However, the inflammatory reaction surrounding the attacked cell does spread from the grey into the white matter.

The primary cellular change is in the cytoplasm (Nissl substance) and nuclear changes occur only after the onset of cytoplasmic chromatolysis. Virus multiplication occurs within the cells. Inflammatory changes occur initially in the perivascular areas and soon after diffusely in the grey matter. Nerve cell changes may occur without any inflammatory response, but an inflammatory reaction does not occur in the absence of nerve cell damage. The first cellular inflammatory response is polymorphonuclear in type. This is very fleeting and has been observed only in experimental animals. In later stages, as shown in autopsies on humans, the cellular response is mononuclear and consists of lymphocytes and macrophages. By the time diagnostic spinal punctures are performed the inflammatory reaction is represented by these mononuclear cells.

Three possibilities exist when the virus reaches and multiplies within the cell: (1) The cell is completely destroyed. Following its death the axon undergoes a typical Wallerian degeneration. (2) The cell is damaged but remains viable although physiologically inactive. (3) There is cellular damage, but retention of normal functions.

The fact that damaged cells may retain or regain their function explains the fleeting paralyses so often observed clinically. Such transient palsies have been previously attributed to oedema. Bodian's work strongly suggests that the oedema concept is in error. He noted that when oedema was present most of the anterior horn cells were already destroyed and recovery of function was impossible. In addition retention of cellular function in damaged cells explains the presence of neuronal inflammatory changes without clinical symptoms. In 24 human autopsies (Bodian) it was noted that in practically all there was an involvement, sometimes

\*From the Wilmer Ophthalmological Institute of the Johns Hopkins University and Hospital.

†University of North Carolina Medical School, Chapel Hill, N.C.

‡Associate Professor of Ophthalmology at Johns Hopkins Medical School, Baltimore, Md.

severe, of the majority of the motor nuclei of the brain stem and yet clinical signs of paralysis were rarely recorded in the corresponding muscles except in the face, pharynx and larynx.

The process of nerve cell destruction reaches its peak within the first 3 to 6 days. Then the recovery stage commences. By the fourth to sixth week the viable motor neurons are completely normal. It follows that the maximum paralysis occurs within the first week of central nervous involvement. Subsequent paralyzes are not due to the spread of the virus but to small areas of focal softening and hæmorrhage.

The lymphocytic response tends to increase with convalescence. We can offer no explanation for this remarkable feature of polio. By the second month massive perivascular infiltrations are noted. These may persist for six months. Probably this accounts for the prolonged increase in spinal fluid protein which is so typical of poliomyelitis.

The production and degree of paralysis is dependent upon the number of motor cells destroyed or damaged. Probably this is influenced mainly by three factors: (1) Variations in the toxicity of virus strains. (2) Previous experience of the host with polio virus. (3) Inherent variations in individual susceptibility.

The injury to a motor centre must reach a certain threshold of severity before a clinical effect is observed. Bulbar complications are frequent but demonstrable clinical involvements of the oculomotor nuclei are relatively uncommon. It is obvious that a sufficient number of motor cells retain their function. In amplification of this, the following observations merit consideration. The number of cells in the sixth and fourth nerve nuclei actually outnumber the motor fibres, in their respective nerves—in the fourth nucleus there are 85% more cells than motor fibres and in the sixth nucleus 50% more cells than motor fibres. Doubtless the excess of cells points up, in part, the motor association connections. The ratio of nerves to ocular muscle fibres is one nerve fibre for every five to ten muscle fibres, as compared to one nerve fibre for every 120 fibres in a thigh muscle. It is clear that compared to other motor nerve centres there is an anatomical basis for a greater margin of safety in the oculomotor centres. Each ocular muscle is also powerful enough to exert a pull one hundred times that needed to move the eye. It would indeed require a devastating blow to the

nucleus before any clinical evidence of paresis of a muscle is observed.

To observe ocular muscle complications frequently requires more than a casual eye examination.

#### DISTRIBUTION OF LESIONS

The cerebral cortex is rarely involved and when it is the lesions are confined to the motor area of the precentral gyrus and are rarely severe enough to produce clinical signs. The cerebellar cortex, except for the vermis, is rarely if ever affected. Encephalitic symptoms are not associated with a heavier than usual cortical involvement but rather with a greater intensity of reaction in the brain stem. It has been suggested that the symptoms are primarily due to an associated anoxæmia. The meninges show only a mild exudate and probably do not cause the neck and back stiffness which is more likely due to brain stem involvement (Bodian). Brain stem involvement is usually most severe in three main areas: (1) Reticular formation (this forms the central core of the brain stem and is thought to contain centres for respiration, swallowing, vasomotor and motor inhibitory mechanisms). A lesion at this site is the most frequent cause of death. (2) Vestibular nuclei. (3) Roof nuclei of the cerebellum.

These three areas are intimately connected and appear to be concerned with modification of motor activities originating in the cerebral cortex. It is remarkable that vertigo, ataxia, nystagmus, nausea and vomiting are not observed more frequently.

Spinal cord involvement is always in the anterior horn cells. Severe involvement may also moderately affect the intermediate and posterior horns. The posterior columns are occasionally damaged and this may account for the spasticity and pain observed in paralyzed muscles. Severe destructive lesions in the sympathetic motor columns of the cord have been found also, but never any damage to sympathetic ganglia (Bodian).

It is significant that no pathological examination has ever disclosed damage to the visual cortex or the visual pathways, including the optic nerves. Bodian and Howe inoculated directly the visual cortex and the vitreous of their experimental monkeys but could never produce any inflammatory reaction in any part of the optic visual pathways.



Patients are generally described as having a certain type of polio. Spinal, bulbar, cerebellar, cerebral (encephalitic) or meningeal are the usual descriptive terms. From a clinician's viewpoint, this is an extremely easy and communicative manner in which cases may be discussed. However, the pathological findings almost invariably indicate a much more widespread involvement than the symptoms suggested. There is little evidence for an encephalitic or meningitic type of poliomyelitis even though the clinical symptoms suggest such an involvement.

#### OCULAR COMPLICATIONS

Case	Age	Sex	Ocular signs and symptoms	Results
1.	5½	M.	L.VI. partial R. III (ptosis) pupils normal	Cleared
2.	13	M.	R.VI.	Cleared
3.	3	M.	L.VI.	Cleared
4.	5½	F.	L.VI. L.VII.	Cleared
5.	8	F.	L.VI. L.VIII. Partial L.III. Dilated left pupil which reacted	Cleared
6.	16	F.	Liplopia and blurred vision—first symptom complete left external ophthalmoplegia. R.VI. Pupils normal.	Patient died
7.	29	M.	Partial R. III. (ptosis).	Patient died
8.	22	M.	Partial L. III. (ptosis).	Cleared
9.	16	M.	Anisocoria.	Cleared
9.	16	M.	First symptom "eye weakness". Complete external ophthalmoplegia—bilateral. Nystagmus prior to ophthalmoplegia. Transitory visual loss R./100 L.20/70. Pupils pinpoint.	Vision normal residual glance palsy (left):
11.	4	F.	Nystagmus—horizontal. Paralysis conjugate movements downwards. Weak lateral conjugate movements bilateral.	Marked improvement
12.	23	F.	Nystagmus—horizontal and vertical. Transitory visual deficiency for distance. (Not recorded).	Cleared
13.	2	M.	Nystagmoid movements. L.VII. (unable to close lids).	Cleared
14.	5	M.	Diplopia—first symptom—no muscle palsy. Nystagmus—horizontal.	Cleared
15.	4	M.	Vertical nystagmus. Diplopia—no muscle palsy	Cleared
16.	16	F.	Horizontal nystagmus.	Cleared
17.	20	F.	Nystagmus—horizontal and rotatory.	Patient died

#### CHOKED DISCS

That choked discs may develop in poliomyelitis is not well known. This is because ophthalmoscopic examinations are routinely performed only during the early stages of the disease. They characteristically appear late in the disease, during the recovery phase. Undoubtedly this late optic nerve change occurs more frequently than has been reported.

Weimann *et al.* reported five cases of measurable papilloedema seen in 103 patients with acute anterior poliomyelitis. In these cases papilloedema developed in from 11 to 48 days after the onset of the infection and subsided in from 13 to 140 days. Visual acuity and fields were normal in three cases and not examined in the other two. Spinal fluid was studied in only three of the cases; the pressures varied from 180 to 600 mm. Only one patient was investigated with ventriculography and dural sinus venography.

The ventricular system and the dural sinuses were normal during the period of papilloedema. Spinal fluid pressure did not seem to be related to artificial respiration, or to obstruction to venous drainage from the head by a respiratory collar. There was no vascular hypertension. Gammon remarked on the occurrence of the oedema in the convalescent period when the spinal fluid protein is known to be characteristically high.

Ayer and Trevett reported a measurable papilloedema five weeks after onset, with normal vision and fields. There was subsidence of the choked discs over a period of two months. The

patient was a 17-year-old male with bulbo-respiratory poliomyelitis without any other ocular signs or symptoms. The cerebro-spinal fluid pressure measured as much as 700 mm. and showed a markedly increased protein content (exact amount not stated). It took five months for the protein and pressure to return to normal.

In all probability many of the reported cases of optic neuritis are in reality examples of choked discs. Wagener points out the extreme difficulty that arises in distinguishing optic neuritis and choked discs in cases of encephalitis. He cited three cases of encephalitis (non-specific, lymphocytic and measles) with presumable optic neuritis (loss of vision and central scotomata). In one of these patients there was increased spinal fluid pressure.

The mechanisms accounting for choked discs can only be speculated upon. The spinal fluid pressure was increased in a majority but not in

all. The spinal fluid protein was increased in all the cases in which a protein examination was performed. It has recently been suggested that increased spinal fluid protein may be a factor in the production of choked discs, *e.g.*, in Guillain-Barré syndrome and also in spinal cord tumours in which choked discs are occasionally observed.

#### OPTIC NEURITIS

The occurrence of papillitis, retrobulbar neuritis or any inflammatory change in the visual pathways is seriously open to question. Autopsy examination of humans or infected experimental animals has never revealed such an involvement. Bodian is authority for the statement that direct inoculation of the virus into the visual cortex of monkeys did not result in any inflammatory changes in the cortex or any part of the visual pathways. Similarly virus inoculation into the vitreous failed to effect the optic nerves or pathways.

Emmons in 1931 concluded, after examining 70 cases during a period of 10 years, that optic neuritis as a complication did not exist. Muller in 1909 after studying 50 cases, stated that if an optic neuritis were present the diagnosis of polio was seriously open to question. (Emmons). Other more extensive reviews by Kindt and Knudtzon, Wernstedt and Leegard did not include optic neuritis.

Ghormley in 1925 reviewed the subject of optic neuritis and presented a case. Curiously, his descriptions indicate that his patient exhibited choked discs rather than optic neuritis. In 1925 there was much confusion in terminology. In consequence, it is highly doubtful that other cases of optic neuritis (Wickman and Tedeschi—mentioned by Ghormley) would be so diagnosed today.

Muck in 1934 described a case of a 37-year-old female with a bilateral rapid loss of vision accompanied by oedema of the discs occurring over a period of 36 hours. This was followed in 2 days by complete paraplegia. The only reason given for the diagnosis of poliomyelitis was on the grounds that he could detect no sensory loss. Neuromyelitis optica is a much more likely diagnosis even in the face of absent sensory findings.

Bergman in 1942 reviewed the literature and remarked that all previously reported cases were open to doubt. He presented one proven case of poliomyelitis with optic neuritis (polio virus was recovered from the stools). He remarked that the

virus of polio may not have been responsible for the optic neuritis. One month after the onset of paralysis, while making a good recovery, this 9-year-old girl had a sudden loss of vision. There was oedema of the discs with large central scotomata and vision of 1/60 and 2/60. The vision gradually improved over the following six months to normal. It would be difficult not to accept this as optic neuritis, but to describe the optic neuritis as due to polio is open to question. The virus does its damage in the first ten days, at the most, and recovery is the rule after this with inability to identify the virus in the spinal cord. In this case one must accept the optic neuritis but ascribe it to some other causative factor.

It would seem reasonable to state that optic neuritis is not associated with polio.

#### *Transient loss of vision (not optic neuritis).*—

It is difficult to explain a transitory loss of vision which occurs during the acute stages of the disease in a minority of cases. We have included mention of three such cases (cases 6, 10 and 12) and have found two others reported in the literature (Wright, Shumway), in addition we are indebted to Dr. C. T. McCoy of Kansas City, Missouri, for a report of his case.

In evaluating these six cases it is of interest that in all of them there was evidence of extensive brain stem involvement. The data pertaining to our cases is seen in the table. In Wright's case there was complete bilateral external ophthalmoplegia with small pupils that responded feebly to light. In Shumway's case there was complete external ophthalmoplegia on the left, incomplete on the right; also there was a left Horner's syndrome. McCoy's case was a 33-year-old female with bulbo-spinal poliomyelitis. This patient was treated by tracheotomy and artificial respiration. Approximately five months after the onset of the disease, while out of the respirator for one hour four times daily, she suddenly developed mental confusion and blindness (no light perception). Pupils reacted normally and the fundi were clear. Within three days, following continuous use of the respirator, vision had returned and the mental confusion had vanished. Of these six cases, all but one survived and in the survivors there was complete recovery of vision within a short time. In all instances the fundi were normal.

The explanation for temporary reduction of vision is by no means clear. In patients who are



suffering from severe brain stem involvement it is difficult to record accurate visual acuities. The following possibilities may explain such loss of vision: (1) Loss of accommodation might explain Wright's case in which only reading vision was recorded. (2) Nystagmus seems the only explanation in case 12 (see table). (3) Anoxæmia with cortical depression might account for transient visual loss. It has been shown that the administration of oxygen clears the mental confusion exhibited by many cases of "encephalitic" polio. This would appear to be the explanation for McCoy's case.

*Visual agnosia.*—We have found mention only of a single case of visual agnosia (mind blindness). Neilsen and von Hagen described such a case in a 49-year-old nurse during a polio epidemic. The patient had diplopia at one phase although no definite ocular palsy was identified. She was described as having "encephalitic polio" and made a complete recovery except for the visual agnosia which persisted. The authors were unable to explain a pathological background for such a disturbance. It was suggested that a cerebral softening might have occurred or that some selective toxic action was responsible.

*Ophthalmoplegias.*—The most frequent eye symptom in polio is diplopia. This may occur as the first complaint in the disease (see cases 6, 10, 14). However, not uncommonly diplopia may occur in the absence of any demonstrable paralysis (cases 14 and 15). In such instances, the diplopia, and the cause is unknown. Other observers have also noted this "phantom" diplopia (Kindt and Knutzon). To state that such diplopia may be "cerebral" does not clarify the situation.

Usually muscle palsies are not isolated and are associated with other evidences of brain stem involvement. The sixth nerve is affected more frequently than the third, and the fourth nerve is involved very rarely. Sixth nerve palsy is usually unilateral although bilateral involvement has been observed (see cases 1 to 6). In none of our cases was there a demonstrable involvement of the fourth nerve except from inference as associated with external ophthalmoplegia. Isolated trochlear paralysis is a rare occurrence and has been recorded (Takahashi, Y.).

Third nerve involvement is the next most frequent of the ophthalmoplegias. It is usually partial and may be associated with extensive supranuclear involvement (cases 1, 6, 7, 8, and 10, questionable cases 5 and 9).

Total bilateral external ophthalmoplegia occurred in one of our cases (10) and complete unilateral external ophthalmoplegia in one case (6) terminated by death. Wright reported a bilateral case and Shumway a total external ophthalmoplegia in one eye and a partial ophthalmoplegia in the other eye. Pflugfelder and Hauser reported a total external ophthalmoplegia which was bilateral. In all these cases, the pupils were small. Recovery was complete except for residual conjugate palsy (of upward movement in Wright's and Shumway's cases of lateral gaze to the left in our case 10). Thus it seems obvious that supranuclear (gaze) palsies are not uncommon in polio and in large part are responsible for bilateral total external ophthalmoplegia. The absence of pupillary widening indicates at least incompleteness of nuclear third nerve involvement in such cases. In one instance (case 11) a palsy of conjugate gaze downward was an outstanding ocular sign.

*Seventh nerve palsy.*—This is not uncommonly seen in polio (cases 4, 5, 13). It is usually found in association with sixth nerve involvement. Recovery is the rule.

*Pupillary abnormalities.*—There are no characteristic pupillary changes in poliomyelitis. We did not find any reports of a dilated fixed pupil. If this occurs, it certainly does so rarely. Several examples of Horner's syndrome have been observed in this disease (see Ehler, Shumway). This finding is interesting in the light of a report by Pollock *et al.* to the effect that extensive investigation on paralyzed extremities revealed no sympathetic involvement. Bodian has pathological proof that the sympathetic column in the upper spinal cord or medulla is affected. It is doubtless a very rare complication. When present it is usually associated with a paralysis of the upper extremity of the same side.

*Nystagmus.*—This is the commonest ocular complication. It occurs either in a pure form or associated with an ocular muscle palsy or paralysis of conjugate movements. The nystagmus may be lateral, vertical or rotatory, or combinations of each. Eight of our 17 cases showed nystagmus, (Cases 10 to 17). Six were not associated with any oculo-motor palsy. As regards the remaining two cases (Case 11 was associated with supranuclear involvement and Case 10 developed bilateral external ophthalmoplegia). The nystagmus spontaneously disappeared except for Case 17, which had a fatal outcome.

In the 1947 English epidemic, two separate observers described a peculiar type of nystagmoid movements which were present before any paralysis (Strickland, Marmion and Sanderlands). They suggested this sign might be pathognomonic of early acute anterior polio. In attempting to fixate an object these patients showed rapid jerking movements of decreasing amplitude. There was no rapid or slow phase. The movements generally were horizontal but were occasionally vertical, oblique, and rotatory. There were up to six oscillations until the object was finally fixed and then the movements ceased. In some patients, the oscillations appeared spontaneously or were intensified by emotions. We do not have any experience as regards this sign. Orzechowski first described such a phenomenon and gave it the name of opsoclonia (Strickland).

In a paper read before the ophthalmological section, the American Medical Association 1953 (not yet published), Cogan has termed such movements "ocular dysmetria". He reserves the term "opsoclonia" for chaotic movements. However, Orzechowski in 1927 used the eponym "opsochorie" to distinguish chaotic movements such as rarely are evidences of encephalitis.

#### COMMENT

The incidence of ocular complications varies widely in different epidemics. In 1950 in the Baltimore area there were 341 cases of polio admitted to the City Hospitals of which 10 cases showed ocular involvement (2.9%). In 1952, there were 138 cases admitted with ocular involvement in 7 cases (5.1%). The overall picture of the years 1950, '51 and '52 showed 516 cases admitted, 17 of which revealed ocular complications (3.3%). However, during this period, if one considers only the polio cases which were clinically identified as bulbar or cerebellar—76 cases in all—then the percentage of ocular complications was 22.4%.

The present trend in polio care is for wider use of home treatment when the condition of the patient and individual circumstances permit. One might, therefore, expect in the future, a higher relative percentage of bulbar cases and ocular complications in patients admitted to hospitals.

Many clinicians have thought that the presence of ocular signs have grave prognostic significance. In the Baltimore series 3 of the 17 cases with these signs terminated fatally (17.6%). In the 76 bulbar and "cerebellar" cases (which ac-

counted for 95% of all the fatalities), there were 13 deaths (17.1%). Our experience suggests that ocular signs are merely part of bulbar involvement and in themselves have no particular significance as regards mortality.

#### SUMMARY AND CONCLUSIONS

This paper is largely based on 516 cases of polio admitted to the Baltimore City Hospitals from 1950 to 1952 inclusive. Included is a brief review of the pathogenesis and pathological background of the disease, with the most recent immunological concepts.

1. Choked discs occur in the convalescent stage of the disease and may persist for weeks or months. The explanation for increased intracranial pressure is not known with certainty. It may be in some way dependent upon the increased spinal fluid protein. The condition spontaneously subsides without damage.

2. It is highly unlikely that intraocular optic neuritis occurs in this disease. In the past, it has probably been confused with choked discs. If an optic neuritis with swelling of the discs is present, the diagnosis of polio is open to question.

3. A transitory visual depression may be present and is usually associated with extensive brain stem involvement. The possible explanations for this are speculated upon. Survival of the patient is always followed by prompt return of normal visual acuity.

4. Nystagmus, usually horizontal but occasionally vertical or rotatory, is the commonest ocular complication. Recovery is the rule.

5. Opsoclonia has been observed in polio. It has been proposed (Strickland) that in some epidemics, this phenomenon indicates early acute anterior poliomyelitis.

6. Any muscle palsy may be present. A unilateral external rectus palsy is the commonest. Partial third nerve palsy is fairly frequent. Total third nerve paralysis probably does not occur but may be simulated due to supranuclear involvements. Fourth nerve paralysis is very rare.

7. The eyelids may be affected due to seventh nerve involvement; this is not uncommon.

8. Any pupillary abnormality may occur except for dilated fixed pupils which are practically unknown.

9. Horner's syndrome is an infrequent complication associated usually with an involvement of an upper extremity.

10. If the patient survives there is rarely any



ocular disability remaining. The recovery is rapid, usually within the first month. Recoveries have been reported up to six months. The only exception is external ophthalmoplegias which may show a residual glance palsy.

11. In an epidemic not infrequently the first evidence of the disease is diplopia or blurred vision. The examiner may find muscle palsy, nystagmus or no evidence for the complaint.

12. Ocular complications are no more an indication for a fatal termination than any other type of bulbar involvement.

#### REFERENCES

1. AYER, J. B. AND TREJETT, L. D.: *Arch. Neurol. & Psychiat.*, 31: 396, 1934.
2. BERGMAN: *Acta Paediat.*, 30: 176, 1942.

3. BODIAN, D.: *Bull. Johns Hopkins Hosp.*, 83: 1, 1948.
4. *Idem*: *Am. J. Med.*, 6: 563, 1949.
5. *Idem*: *Am. J. Pub. Health*, 42: 1388, 1952.
6. *Idem*: Personal communications.
7. EHRLER, A. H.: *Ugesk. f. Laeger*, 98: 1214, 1936.
8. EMMONS, H. M.: *Am. J. Ophth.*, 14: 927, 1931.
9. GHORMLEY, R. K.: *J. A. M. A.*, 84: 570, 1925.
10. KINDT, P. AND KNUDTSON, K.: *Acta Ophth.*, 24: 295, 1946.
11. MARMION, D. E. AND SANDILANDS, J.: *Lancet*, 2: 508, 1947.
12. MUCK, O.: *Klin. Monatsb. f. Augenh.*, 93: 333, 1934.
13. NIELSEN, J. M. AND VON HAGEN, K. O.: *J. Nerv. & Ment. Dis.*, 84: 386, 1936.
14. PFLUGFELDER, M. AND HAUSER, F.: *Ophthalmologica*, 118: 378, 1949.
15. POLLOCK, L. J. et al.: *Arch. Neurol. & Psychiat.*, 67: 725, 1952.
16. SHUMWAY, E. A.: *Tr. Am. Ophth. Soc.*, 37: 179, 1939.
17. STRICKLAND, B.: *Lancet*, 2: 369, 1947.
18. ORZECZOWSKI, C.: *J. Fur Psychol. und Neurol.*, 35: 1, 1927.
19. TAKAHASHI, V.: *Klin. Monatsb. f. Augenh.*, 47: 270, 1909.
20. WAGENER, H. P.: *Am. J. M. Sc.*, 223: 205, 1952.
21. WEIMAN, C., McDOWELL, F. AND PLUM, F.: *Arch. Neurol. & Psychiat.*, 67: 695, 1952.
22. WRIGHT, E. S.: *Am. J. Ophth.*, 30: 1294, 1947.

### SOME PSYCHODYNAMIC ASPECTS OF PREGNANCY\*

DANIEL CAPPON, M.B., Toronto

THE FIRST COUPLE were warned: "In sorrow thou shalt bring forth children", and because, as psychiatrists, we are much dedicated to the study of sorrow, it is well to turn our enquiring minds to the psychological period and circumstances in which children are brought forth.

Moreover, when tracing back the deeper source of "sorrow", even in adults, one is inevitably led back to childhood and thence to the motivation for pregnancy, ending with the beginning of the prime human relationship between the mother and her child. In our chronological recording of the personal history of a patient we begin, or should begin, with the conditions of pregnancy leading to our patient's birth. Thus, when puzzled to know what thread to pull out of the continuum of life, out of the labyrinthine complexity of human relationships, to disentangle the causes of sorrow, what more logical than that of the motives for procreation and the events, normal and otherwise, of pregnancy and the puerperium. Yet a search of the literature shows paucity of accurate and adequate study.

It is distressing also to find that the gulf between obstetrician, and even paediatrician, and psychiatrist, whose interests border on this area, has not been bridged, despite the fact that joint

decisions are often made, directly concerned with two human lives (mother and fetus), and indirectly with the primary human unit (the family). The decision to terminate or not to terminate a pregnancy, under the rule of the law, is made not in the light of explicit and uniform scientific knowledge leading to generally acceptable principles, but in the shadow of personal experience—"often fallacious"—and local statutes and bias. Too often the consequences are: more sorrow, mutilation or even death.

Lastly there is a continuous challenge, to those of us concerned with psychodynamics, to search for a specific constellation of factors explaining certain "syndromes" or trends out of the spectrum of emotional illness. The situation of pregnancy is unique and thus carries with it such specific factors.

Hippocrates<sup>2</sup> taught that: "In women blood collected in the breasts indicates madness" (Aphorism 3:40) "per lactis migrationem ad cerebrum"; MacLeod<sup>46</sup> classified all mental disorders associated with pregnancy as "puerperal mania", but in 1865 Batty Tuke and Bucknill<sup>14</sup> separated them in the classical phases of gestation, puerperium and lactation. The clinical descriptions of those physicians of the Royal Bethlehem Hospital (otherwise known as 'bedlam') remains unrivalled.

For no obvious reason, possibly other than the advent of Meyerian psychobiology, from the 1930's opinions changed unanimously, to be now expressed thus in the words of a modern (Cruickshank)<sup>18</sup> "psychoses associated with pregnancy are in no way different from other biogenic psychoses". This view is as sterile as Sir Frederick Mott's<sup>53</sup> hypothesis that "all psychoses belong to one group and are genetic in origin". The result has been indolence, diffuseness and impeded progress so that we have failed to give leadership where it is essential to do so. It was not until Helen Deutsch,<sup>20</sup> Kroger and Freed, and a few others, that this subject began to be illuminated.

\*From the Department of Psychiatry, University of Toronto.

This paper is offered to give perspective, a birdseye view, and some of the major psychological factors and sequels of childbirth; it may help both to formulate generalities and to indicate specific areas for intensive research. The material is drawn from a detailed survey of some 70 patients attending a psychiatric clinic, and a dozen patients studied privately, as well as a review of some 150 references from the literature.

#### SPECIFICITY AND UNIQUENESS IN PREGNANCY

In searching for specificity, or even uniqueness in pregnancy, we may look at four orders of settings in which it occurs:

1. *Psycho-social setting.*—Society brings to bear special influence on the pregnant woman. Among the primitives, there may be sacrificial ritual of the first-born; the Marquesas' story ends with the man's first-born. Among the Indians and Chinese there is a premium on the male to ensure immortality; among the peasantry of the world there is the same premium to ensure cheap labour. The grandparents are proud to see their extension in yet a new generation. The husband is in awe of the mystery in which he cannot fully share. The mother and family and friends bring special concern alongside the old wife's tale. The children already born are curious and anxious about this new "fact of life" and ask their first questions. There is a general atmosphere of anxious, exciting expectation, such as cannot be socially duplicated.

2. *Psychobiologic setting.*—The sexual and reproductive instincts have fused with the self-preserving instinct to make for life in perpetuation. The mother and child repeat the history of the species (phylogeny) and of the individual (ontogeny). The drives to motherhood and later motherliness are to find their unique goal; and the woman's biological rôle is fulfilled. No less the wish for fatherhood and fatherliness is fulfilled, and thus a human cycle is completed.

3. *Psychophysiological setting.*—When pregnancy occurs a stage of maturation, at least of genital and endocrine systems, has been reached. It can only occur within the menstruating period of a woman's life, and she is amenorrhœic for the length of conception. The somatic and especially endocrine changes are so peculiar that such a group of heterogeneous disorders as migraine, neurosyphilis, panhypopituitarism, asthma, peptic ulcer, rheumatoid arthritis, myasthenia gravis,

and the ascites of cirrhosis, may be improved, while others like disseminated sclerosis may be aggravated. The physical experience of the actual birth is unique.

4. *Intrapsychic setting.*—Ideally pregnancy crowns feminine psychosexual evolution. During its course, the stages of libidinal development are recapitulated and previous fixations will make themselves obvious once more. There is a special chain reaction in which the pregnant woman, an extension of her own mother, as only a daughter can be, regresses and wishes to be nursed once again, and yet jubilates in the expectation of the final proof of emancipation. There is a unique realization of a phantasy in that what was a phantasy making for organic introversion, becomes more real with quickening and assumes full reality with birth. Finally the universal phenomenon of polarity receives its highest charge and discharge in pregnancy. Though ambivalence may exist, there is triumph of life over death, of motherhood over self-preservation, of motherliness over sexuality, of passivity and submissiveness over aggression and of femininity over masculinity. Woman fulfills her basic functions, listed by Sylvia Payne<sup>61</sup> as receptive (sucking), toleration to depletion (by the baby), adaptation, sublimation, and retention co-ordinated with giving, yet she achieves her most masculine-like wish: she has incorporated the male phallus and with it internalized all the objects of which she has been deprived. Now she is omnipotent; the giver of life. To pay for this in pregnancy, in the first organic-parasitic phase, she is dominated by physical fears, in the next psychic phase (after quickening) by psychic fears, finally there is triumph of pleasure over pain, of altruism over narcissism, in the twilight experience of birth there is a unique expression of woman.

The constellation of psychic processes in pregnancy is specific enough to account for a strange relief of some established neuroses,<sup>34</sup> and for that peculiar feeling of well-being, which one has come to call "spes gravis" (the mood of pregnancy). Even in the multiparous woman the total experience can never be totally the same. In addition to these specific qualitative and quantitative factors, there is an important time relationship in the world of motherhood, with a special psychosomatic interplay in gestation, parturition and lactation. This paper follows along the chronology of these events of pregnancy.



### MOTIVATION FOR CONCEPTION

When Balzac in his "Comedie Humaine" has presented some of this motivation so dramatically, and when a variety of previous literary insights, and our own and our neighbours' homes present them so realistically, it seems a thankless task to attempt a scientific collection and arbitrary division of motives leading to conception. Yet this must be done if we are to progress in our understanding of the mother and beginnings of life in her offspring. Thus we may classify under: (a) marital; (b) extra-marital; (c) premarital; (d) non-marital, a pregnancy which is: (1) planned; (2) wanted; (3) accepted; (4) otherwise, and describe: (i) social; (ii) physiologic, and, (iii) psychic factors, varying from conscious to unconscious, erotic to motherly, and normal to pathologic.

(a) *The marital legitimate and planned "normal"* motivation is the vaguest and hardest to know about for it is the least likely to present itself to the psychiatrist, yet it is the most important, for on it assessment of deviation is made. Social and conscious factors may be: to make a happy home, to provide companionship for an only child, or match a girl with a boy, to compensate for the death of a child, to provide an heir for the family, a male to carry on the name, or as a broader obligation towards society needing "good stock" (usually of one's own culture), or just "stock" (for the wide open spaces). Religious and economic influences may play a part. Who knows whether the strong desire to replace husbands gone to the war and males destroyed, does not account for the strange phenomenon of a prevalence of male infants in wartime?

Not the least is the influence of loneliness, boredom and purposelessness created by a husband absorbed in dollar-driving; or the companionship of a bridge club in which the other three members have been pregnant; or to provide an eternal subject for conversation and pride with the woman-next-door. The physical component may vary from repeating previously experienced "spes grvida", breast sucking or womb-filling, to sparking ovarian activity even to compensate for pituitary insufficiency.

The psychic components, especially the unconscious ones, have even richer nuances. They vary from erotic, motherhood wishes to express love and gratification toward husband, to provide a human object for their bondship, to prove

womanhood, to re-enact the mother-child memory of a happy childhood (an extension of doll-playing), to re-cast her own or the husband's image, to prolong youth through reliving in children, to become a child once again, to realize the nesting instinct in knitting and providing a layette, crib or room—to motherly wishes: to love and care for an innocent, helpless infant.

A relationship with time is apparent in that the motive for conception during the honeymoon may differ from one five years after marriage, similarly it may differ in adolescence and near involution, in the primigravida and later. Equally there is a relation to the expected sex of a child: where repetition of mother-daughter is wanted, a girl is desired; where father-husband repetition of substitutes are needed, a boy is desired; where sameness of sex has occurred there will be a strong wish to relieve the monotony. In general, normality of motive will be a function of psychosexual maturation.

*Abnormal motivation* is mainly intrapsychically derived and usually has strong unconscious determinants. Yet it is no more necessarily compatible with a difficult pregnancy than a normal one is with the opposite. De Lee's witticism that "pregnancy is a disease of nine months' duration" approximates the truth only where despite a "negative" motivation pregnancy occurs, or in a rare syndrome I have come to call "gestational psychosis".

In general abnormal motivation is a reflection of a faulty relation between the woman and her parents, a deviant relation to the husband and psychosexual immaturity, and a particular imbalance of the factors specific to pregnancy.

Two clinical examples must suffice:

#### CASE 1

Mrs. A., a wealthy young Socialite, successfully planned for an only daughter within 2 years of marriage. Since she had chosen an alcoholic weakling for her husband, and they had a name and wealth to pass on, her motives were easily rationalized. Analysis, however, revealed a startling compulsive pattern spanning over four generations. Her grandmother and mother, both beautiful and highly talented, aggressive women and torturers of men's hearts, chose weak mates and begot one daughter. They faithlessly trotted the globe, idolized by men and "the public", submitting to violent carnal orgies, and dragging along their only daughter, sensitive and aroused, a living object for their maternal and sadistic ambivalence. Now it seemed that the child of the fourth generation was moulded to tread the same fateful path.

#### CASE 2

Mrs. B., helped by psychotherapy, finally broke her homosexual tie with her coldly beautiful, masculine, nymphomaniac mother. So fused was their body-image,

so complete their "unio-mystica" that they could hardly distinguish where mother began and her spit-image daughter ended. When separation came it had to be violently painful; the daughter eloped with a husband who would have been branded as undesirable, and did not even invite the mother to the wedding. Separation brought about an emotional breakdown in the mother. To prove her femininity, to gain her independence, she wanted a son.

An *unplanned* but then wanted pregnancy indicates an initially unfavourable balance of social, physical and/or intrapsychic factors, eventually tipped by motherhood, motherliness and a good home situation. An *unplanned* and *unwanted* pregnancy, in which the infant and his sex is finally accepted, usually in the act of delivery or in meeting the baby, reflects a graver imbalance. The commonest negative *conscious* factor is adverse economy.

Where the infant is *still rejected*, it is a reflection of negative motivation, where perhaps only the erotic component existed. It is necessary to stress that only in true rape is a truly "accidental" pregnancy possible, so that usually where accidental pregnancy has occurred there will have been motive, albeit deeply buried and perverted. Pregnancy may be planned and wanted, yet the child not accepted: either because the erotic sensation alone was desired, or because religious asceticism or ignorance forbade prevention, or because the sex of the child revives deep conflicts.

(b) The *extramarital* pregnancy has numerous motivations. A physically rooted one, acceptable in some societies, is sterility in the husband. Perhaps the commonest in restless times is separation from the mate, when the erotic drive and a narcissistic desire for pregnancy contribute. Perhaps the subtlest is the intrapsychic schism in which the husband is the object of love and the other man the object of passion. In this series only 2 out of 70 were extramarital pregnancies, which is much lower than Slater's<sup>70</sup> ratio of 1:7.

#### CASE 3

This was an intelligent woman with an unresolved Electra complex. Her father was weak but sadistic and she married and loved his image. The father of her child, however, was strong and kind and typically the incident of a romantic sea voyage.

(c) *Premarital* pregnancy "legitimized" is commonly due to the delay in expressing heterosexuality and love impeded by modern society. The biologic drive, with all its positive components, provides the motive; the negative factor is provided by adverse socio-economic circum-

stance and emotional unreadiness. In this series 1:3 were such pregnancies and this corresponds with Slater's<sup>70</sup> figure. Despite Unwin's<sup>80</sup> theory, our deistic culture not only sublimates some impeded sexual urge into monuments of work, but also allows prenuptial defloration in some 68% of women.

(d) The *non-marital* illegitimate pregnancy is motivated by myriad impulses and situations: the loneliness of adolescents seeking intense excitement, the flight from a broken or unhappy home, the veritable compulsion to act out more fully the Electra situation, the passivity and dullness of a woman with poor social consciousness, but who needs to be liked and to love, a perverted hostility punishing society, complete union with a married lover, a spinster's last chance to indulge motherliness, are but few of the motives. In the majority of cases the fetus as such is of no primary importance and it is often denied even when it is a *fait-accompli*. In this series nearly 1:2 were such pregnancies, which is much higher than the widely quoted ratio of 1:30.

Herewith are some clinical examples:

#### CASE 4

This was a woman who loved, for complex reasons, an adventurous European blackmarketeer. She wanted to have children by him before he disappeared into the night. Later when she married another to protect them, she was so revolted by being made pregnant by her husband that she demanded an abortion.

#### CASE 5

This was an adolescent athlete and scholar, disappointed in her beloved father, strongly ambivalent towards her mother, haunted by lesbian masturbatory phantasy; she took flight into a proof of womanhood only to recoil from the end result and abort.

#### CASE 6

This was an immature girl resolving her schizophrenic process with a strong transference on her therapist. When he left she allowed herself promptly to be impregnated by his "double".

#### CASE 7

This was a crippled nurse, who felt life passing her by and the longing to be aroused erotically and to love a baby. She was capable of the highest maternal sacrifice when she gave up her baby after nursing it, for the sake of society and the baby's better care: she became suicidally depressed.

Out of these motives, the most interesting constellation is: *a syndrome of proneness to repeated, accidental, illegitimate pregnancies*. Seven such cases have been collected. They exhibit the following features: The syndrome tends to occur in the third decade of life, in a Western product of a broken middle-class home,



and resembles "accident proneness". There is a high incidence of illegitimacy in the family history, and the patient is often the youngest of many siblings. There may have been early sexual arousal with resultant exhibitionism and pseudo-eroticism, and a latent masculine protest perhaps amounting to homosexuality. Invariably there is an unresolved Electra complex with hostility towards mother and a self-punitive "flight" into promiscuous sexual behaviour, which ends repeatedly in pregnancy. The mate is an acquaintance, often chosen for his mental or physical infirmity and towards whom there is no more tenderness than towards the fetus, which is invariably disposed of by abortion or adoption; the gestation is depressive with little apparent remorse for the act and with vengeful feeling towards the family and society at large. But there may be happiness as long as there is retention of fetus without sign of its life. There is always masochism, often with self-injury or suicidal thoughts. A typical case is as follows:

#### CASE 8

A 22-year old Anglo-Saxon, Protestant girl of a middle class home, but working as a domestic, was the eighth of a family of nine. Her mother loved babies because of their total dependency, and had a continuous supply, legitimate, otherwise and adopted. Her father was a war-invalid and alcoholic. She always wanted to be a boy, played sexually with her brother at 5, was raped by an adult at 12, and consented to intercourse from 14 years onward. She has been pregnant four times up to date, and though she would never inform her family, they would regularly come to get her home. Once pregnant she would have no interest in the putative father, nor claim on him. During pregnancy she would feel "numb" and once quickening started she would be depressed and indifferent to the baby. She has aborted herself or submitted to the operation, or placed the baby for adoption with no apparent feelings. She had entertained suicidal thoughts since 13, often injured herself accidentally, and had both Electra and homosexual phantasies. She was incapable of orgasm and she was vindictive towards her home.

(e) *Pseudocyesis* has been reported by Steinberg,<sup>74</sup> among others, and 400 cases collected back to Hippocrates. It is the opposite reaction to the denial exhibition typically by the adolescent (or psychotic) with an illegitimate pregnancy. It often occurs in the childless menopausal women or spinster who craves to mother a child; though sometimes it happens in the fearful adolescent following illicit intercourse.

#### THE PSYCHOPATHOLOGY OF NON-CONCEPTION AND SPONTANEOUS ABORTION

Psychological aspects of sterility have been reviewed by Kelly,<sup>40</sup> among others, and special clinics have been set up in Britain. Two striking

facts are relevant—(1) the high rate of spontaneous cure following a visit to such a clinic. some 46%; (2) the remarkable occurrence of pregnancy following a decision to adopt. It is safe to assume that if conception has not occurred within a year sterility is a legitimate complaint, and that primary physical deficit in either partner is much rarer than ignorance or a psychogenic etiology.

Striking pathophysiologic immaturity has been observed<sup>81</sup> in the partners and this was so in one case of my series. In general, the male is dependent on the exclusive "maternal" care of his wife and cannot tolerate competition, his sexuality shows aberration and his attitude to "other children" deep ambivalence. The female, as Deutsch<sup>20a</sup> has observed, may have a strong conscious desire for pregnancy, but a deep inherent (Electra) guilt and hostility rejecting the sperm.

The psychic inhibitory effect, together with instinctive avoidance of impregnation at the fertile period, may account for cortical-hypothalamic-gonadal hypofunction. In psychogenic spontaneous abortion, the male plays less frequently a pathological rôle, and the female shows a balancing of factors veering more towards acceptance than in sterility, but still being unable to make it quite. There is a defect in the essential female function of retention, and often a proneness to repeated abortions. Consciously the woman may desire a baby desperately. Where there is no primary gynæcological condition, it is remarkable how retentive a pregnant woman can be. Evidence: common abuses not resulting in abortion, and even mild interference so frequently practised, given up without damage.

From a psychodynamic scrutiny of this series of patients one might go further to postulate broadly the following "spacial" relation between the depth of the masculine-feminine polar conflict and its reflection in pregnancy: (1) Where the conflict is deepest in unconsciousness and negative motivation strongest, sterility may prevent conception *ab initio*. (2) Where it is less deep, spontaneous abortion may occur. (3) Where it is less deep and almost in balance, abortion may threaten. (4) Where it is still less deep and special factors favouring, as will be described later, gestational psychosis may result. (5) Where it is more superficial, psychosomatic rejections (vomiting, toxæmic states) are favoured.

(6) And finally where it is on the conscious threshold, abortion is actively sought. Then the strength of masculinity and narcissism, and yet masochism, will account for the determination and length to which the female partner, at any rate, will go to procure abortion.

Thus we have a spectrum of rejection of pregnancy from sterility to its active termination, in which the time and "space" of unconscious motivation interplays with the somatic picture and this in turn with social events. Dunbar and Squier<sup>24</sup> reported instances of spontaneous abortion which are interesting in that transference to the obstetrician was important, and so one may realize that abortion is not connected with the womb alone. It must be realized, however, that this "working hypothesis" needs much corroboration clinically (from psychoanalysis) and perhaps experimentally. The very notion of levels of intrapsychic depth calls for a fine "tool" for assessing it.

#### PSYCHOSOMATIC ASPECTS OF PREGNANCY

One group of disorders could be understood in terms of the reactivation of psychosexual stages. Thus: *Oral*.—Bulimia, food fads, and pica are associated with oral incorporating phantasy and sucking action. Excessive salivation, nausea and vomiting is the polar response associated with a modicum of rejection and expulsive action. *Anal*.—Constipation is a particular aspect of the retentive action and may be prominent where there are compulsive trends also present. *Urethral*.—Frequency and stress incontinence, though they may be physically determined in the last trimester, are more frequently and bitterly complained of by women with an enuretic complex. *Genital*.—Discharges, pruritus, etc. all have emotional components.

Another group of disorders could be understood in terms of an obviously changing body-image. The union between the ego and non-ego (fetus) is "real" in the first phase of pregnancy.

Amenorrhœa, pigmentation, striation, breast and abdominal enlargement are factors involving the body-image and boundaries, as well as social relationships, such as withdrawal from work and friends, and the necessity to enlighten curious offspring. Abstinence from intercourse seriously involves the erotic relationship with the husband. Quickening is the most novel of inner experiences in that "the stranger is making itself felt". The fear of death is uppermost as the hour

of delivery approaches. No assessment of obstetrics can be complete without investigating psychological motivation, psychosexual development, marital relation and the fears and guilt inculcated in the mother-daughter relationship—"You cannot have a child."

#### PSYCHOPATHOLOGY IN GESTATION

It has been mentioned already that many neuroses abate with pregnancy and the "spes grvida" may dominate.

Psychotic reactions occur but it is not possible to gather from the literature their prevalence during pregnancy because the statistics do not properly distinguish as follows:

TABLE I.

Incidence of psychosis per:

- (1) Pregnancies or parturient women, in the population
- (2) Psychotic women, in the population
- (3) Women admitted to—(a) Obstetric wards  
(b) Psychiatric wards.

but it seems that there is a remarkably low incidence, suggesting that pregnancy protects from psychosis. Puerperium, however, makes up for this. In attempting to establish this hypothesis a search into the records of the Toronto Psychiatric Hospital was made with the following result:

TABLE II.

	Years	Total	Re-admission	New
Total number of patients.....	1930-1947	4,692	783	3,909
Female patients....	1930-1947	2,340	360	1,980
Patients with psychoses associated with pregnancy.	1930-1947	421	44	377

Thus some 18% of total female admissions or some 19% of new admissions were cases of severe breakdown, associated with a phase of pregnancy. It is noteworthy that the percentage of total re-admissions was 15%, whereas for pregnancy cases it was only 10%. Of the total cases associated with pregnancy only 10% coincided with the gestational period, and only 1% were truly *de novo*.

Thus of 1,000 new female admissions: 190 will be associated with pregnancy, 19 will occur in the gestational period, but only 1 or 2 will occur in gestation for the first time.



Solomons<sup>72</sup> gives the figure for the Rotunda in Dublin as 1 psychosis per 666 women admitted to the wards. Skottowe<sup>69</sup> quotes Morton<sup>52</sup> giving the figure for Queen Charlotte's Hospital, London, as 1:1,192. Through the courtesy of Mr. Douglas MacLeod the writer obtained the recent figure from Queen Charlotte's Hospital.<sup>64</sup> It shows that over the past 11 years there were only 5 "puerperal" psychoses in 21,282 admitted patients.

These facts, suggesting the rarity of occurrence together with encountering the first two cases, aroused the writer's interest in psychoses occurring *de novo*, in pregnancy.

(a) *Gestational psychosis*.—It would seem that a syndrome can be distinguished: the clinical picture is that of a bipartite, *schizoaffective* disorder, occurring in pregnancy for the first time, usually with an abrupt onset, often of depersonalization. There are no major etiological physical factors. Treatment with electroplexy is somewhat disappointing. Prognosis is better than in other schizoaffective cases. Though the family history is not overly loaded, one gains the impression that a preponderance of obscured schizoid and manic-depressive genetic trends combine to break through the psychic barrier occasioned by pregnancy and favour this bipartite psychosis. Social factors, like illegitimacy, do not play a major rôle. A search in the records of the Toronto Psychiatric Hospital established that schizoaffective disorders were commoner in females and the increased incidence was due to their association with pregnancy. Others<sup>22, 25, 85</sup> note the same preponderance of schizoaffective disorders.

The psychopathology is that of an essentially frigid, masculine protesting, Western woman, past the peak of fertility, not necessarily a primipara, who has exhibited class-striving, and arrogance, rejection of family and aggressive emancipation. After prevarication she comes to marry an older, pliant male, whom she often dominates, but on whom she depends—her animus. Pregnancy is unplanned and unwanted, but cannot be consciously rejected. It lightens up the essential and unresolved ambivalence in this woman at this time of her psychosexual and marriage development. She may have just been able to adjust to a previous child; another proves too much. The psychosis breaks with marked denial of self and body, and with depression, with projective mechanisms endeavouring to

eject "bad internalized objects", inclusive of the fetus.

Zilboorg,<sup>85</sup> though he partly recognized this syndrome, rejected the possibility of some specificity. The importance of its recognition is wide: Is this the only kind of syndrome liable to break out in pregnancy? Does the biological purpose of pregnancy really protect a woman's mind and body, otherwise? Do the specific psychodynamics of pregnancy satisfy most other psychopathological constellations until the puerperium when the reality of the baby and its social consequences become too disturbing?

This formulation offers a rational approach to treatment. Electroshock is indicated to break up early the pattern of faulty reaction and psychotherapy is necessary to follow through. Not much is known about the physiology of the pregnant uterus and its pharmacological relations to drugs like curare, but on the whole it is best to omit them in the administration of electroshock, especially since a search of the literature shows that ECT and epileptic convulsions fail to abort the majority of women, despite the fact observed by the writer that palpable uterine contractions are caused. There is sufficient evidence, however,<sup>32, 83</sup> that insulin adversely affects the fetus.

The following case out of a series of nine is illustrative:

#### CASE 9

The patient was a 30-year old, Anglo-Saxon, Christian, para one, of superior intelligence; shy, solitary, humourless and snobbish, moody and with high moral standards. She had both depressive and schizoid traits in her inheritance, but had never had previously a serious emotional upset. Her original social milieu was artisan, of lower income and living standard. After prolonged and concentrated effort she "bettered herself" while postponing her wedding some 11 years. This was partly due to the couple's unspoken reluctance in leaving home; though our patient despised hers, she still depended on her mother. She had a son, but only after much vomiting and fatigue. She had no real maternal feelings, nor was she sexually responsive. When she missed her period she felt "cheated", depressed and made a suicidal attempt. She then began forming somatic delusions; she believed she had V.D., which was going to infect her son. Her mild and obsessive, elderly husband became a butt for delusions, letting out long nursed resentment. She was withdrawn and hard to reach. Psychotherapy, despite some gain in insight, was not at first successful. She was given 13 electroshock treatments, controlled with pentothal, d-tubocurarine, postigmine, (these were abandoned in subsequent cases) between the second and third trimester. With some relief in guilt, she improved and finally was normally delivered of a 6 lb. 1 oz. male infant. She had unresolved emotional conflicts still, but was able to return to household duties in six weeks, breast fed her thriving infant, and began attending a rehabilitation social centre. She maintained her improved status six months later. The results of treatment in other cases are by no means uniformly encouraging. As would be expected the reality of the live infant

and continuance of a basically unacceptable marital and sexual situation could only be successfully tolerated if sufficient alteration of personality structure altered the reaction to normal dynamics of maternity.

(b) The subject of psychopathology in gestation cannot be left without a word about the male partner. In an immature male, with an active anima, with talents favouring artistic sublimating activities, the masculine desire for creation is easy to see. The male world, however, can at best deliver itself only of a bon mot, a thought, a scientific paper, a work of art or science. Ambivalence towards the pregnant partner and jealousy of the future baby may play a large part also.

In six males studied, along this series, matters went further. In one schizoid scientist, who had been treated successfully for anxiety, when he finally came to marry he wanted to be sterilized (castrated). In another, a homosexual male, also successfully treated and who came to marriage, there was such an identification (and revulsion) that he, instead of his wife, had morning anorexia, vomiting early and abdominal cramps later in "pregnancy". In all six, highly sensitive and intelligent males, there were deep feelings regarding the change in the woman's body, especially the abdomen, and they would feel the baby's movements with a fascinating compulsion. In two there was a change in their own body-image. In other cases pseudocyesis has been reported. The husband's strength and masculinity play an important, if supporting, rôle in the woman's well-being in pregnancy and in satisfactory delivery and nursing.

#### THE PSYCHOLOGY OF DELIVERY

To quote Deutsch "if delivery were a purely physiologic process, it would probably be subject to far fewer individual variations and cultural influences than it is". Medical experience in India showed the author that delivery need neither be feared nor painful—and that the higher the social scale and more intelligent and sensitive the woman, even in Asiatic society—the more likely are complications.

Essentially co-operation in delivery places the highest physical and psychic demand on a woman, and the greatest stress over the smallest span of time. What she has treasured and retained thus far, she now has to show the altruism to expel, with fear and bleeding, in order to give it an existence separate from herself. In doing so

there must be a fine regulation of polarity, handed right down to the uterine muscle. In the first "emotional" phase she must be passively dilating, and next, exert sufficient activity and aggression to assist; finally she must be patient.

She now has to face her worst fears: an elemental fear of death, a sudden fear that the baby cannot be born, a fear of his deformity, of his death, of pain, laceration and mutilation of her sex organs (*viz.* prolapse), of being left shapeless, of passing on disease after long infertility, or the Rh bogey. These may be rationalizations for deeply seated guilt, punishment for past immoralities, Electra guilt and castration punishment—"you will never have a normal baby". There is always regression to latent psychosexual conflicts: Even the gush of amniotic fluid may bring forth the complex of enuresis.

The first "organic" parasitic phase may be approached with fear of pain, but in the next "psychologic" phase, pain may be welcome, and many women, at bottom, feel cheated if they have been wholly deprived of the pelvic sensation. In the end-phase, there is always a psychic mechanism of dissociation, altering consciousness. Then the obstetrician may discover that he has other names than those given by his parents, and the woman's true character is revealed. In the last phase of delivery of the after birth, there may be anal anxiety over the soiling, and the paranoid fear of retention of poison-products. And when it is all over, to quote again Deutsch in one of her paraphrases *omnis mulier post-partum tristis est* (all women are sad after delivery).

It is remarkable that despite, or perhaps because of, the total stress of delivery itself, psychosis rarely, if ever, breaks out at this time.

*Meeting the baby.*—Many<sup>26, 65, 73</sup> have focussed on the psychosomatic and social primary unit of mother and child. At the height of a woman's own regression, post-partum, when she herself needs to be mothered (as she is in the hospital or home setting), she confronts her lately non-ego, her phantasy: a helpless baby, crying. If narcissism is overcome and passivity overbalanced, there is a new surge: motherliness, in the maternal heart.

If she can fill her breasts with milk and allow the new motherly yet erotically unique sensation to flush her with pleasure, the beginnings of the new relationship are auspicious. It is in this setting that disappointments in expected



gender, and surprises in unexpected multiple delivery trigger off the nascent drama. It is now, at the first meeting, that the new mother asks herself the anxious questions: "Is this my baby—or does it look like my husband's baby?"

Her engulfing arms will replace her womb; the rocking, the gentle floating amniotic fluid; the breast, the feeding life tubes. His cry for the warmth and soundlessness of the inside may evoke her protecting pity, and her hushed whispers may make up for the cruelty of the world. She may ignore his lanugo, wizened appearance and frightening cephalic moulding, and well up with tenderness. She may look forward to giving up her personal freedom, giving of the work of her hands, and giving of her careful loving mind—and she may not.

*Psychology of the puerperium.*—Though this is the last stage of a pregnancy, its detailed discussion is beyond the scope of this paper. It is curious that the majority of writings have been upon this phase of child-bearing; perhaps it is because breakdowns, especially psychotic, are much more frequent (about 4 times) now, than at the other times. In the author's cases 15 out of 70 were puerperal emotional reactions.

Though the literature in general is not particularly illuminating, the papers by Jacobs<sup>35</sup> and Brew and Seidenberg<sup>11</sup> have some value in descriptions and formulatory psychopathology. This time, despite abundant writings, there is still uniformity of opinion that the "nature" of psychosis or neurosis in a puerperal female is indistinguishable from, say, the same order of conditions affecting old males. Probably by this is meant that the mental mechanisms of the mind are but a few, and when they become grossly aberrant, perhaps consequent upon subtle and specific psychopathology, they appear grossly similar. But the strong denial of pregnancy, and even of marriage, the rejection of the newborn, the strong tendency to infanticide (perhaps also an aftermath of the sacrifice of primogeniture in woman's collective unconscious) —"The first born of thy sons thou shalt give unto me", (*Exodus* 13, 1:2), the many sexual and somatic delusions, the projection of the latent homosexual guilt should give some clue to specific factors. In general it can be said that if delivery was the baby's strongest bid for the moment, puerperium is the beginning of his longest bid for all the qualities of motherhood.

She has to be neither a masochistic *mater dolorosa*, nor a rejecting *pater terribile* (father bogey).

#### CONCLUSION AND SUMMARY

Some aspects of the psychodynamics of pregnancy have been reviewed following the course of events from conception to the puerperium. The "uniqueness" of some psychological factors has been pointed up, and special reference has been made to the "principle of bipolarity", which makes more often for a "spes grvida" than it does for pathology. The possibility of specific psychopathological factors, making for recognizable syndromes of emotional disorder in pregnancy, has been pointed up.

The writer would make a plea for adequate observations on psychosexual development, especially of the mother-daughter relation, in conjunction with the prenatal, natal and post-natal periods of a woman's life, and her relationship to husband and future baby, in all psychiatric case studies and in all psychosomatic studies of obstetrics.

He suggests that where specific psychopathologic factors are found, in a constellation or syndrome, there is a practical use in crystalizing them so as to offer a more accurate prognosis, and therefore basis for better management and treatment.

#### REFERENCES

1. ANDERSON, E. W.: *J. Ment. Sc.*, 79: 137, 1933.
2. Hippocratic Aphorism: Published by "The Sydenham Society", London, 1849.
3. ATKIN, I.: *Lancet*, 1: 434, 1938.
4. BAMFORD, C. B.: *J. Ment. Sc.*, 80: 58, 1934.
5. BAPTISTI, A.: *Am. J. Obst. & Gynec.*, 35: 818, 1938.
6. BARBOUR, A. H. F.: *Tr. Edinburgh Obst. Soc.*, 20: 37, 1894.
7. BENEDEK, T.: *Psychosom. Med.*, 3: 1 and 2, 1938.
- 7a. *Idem*: *Am. J. Orthopsychiat.*, 19: 642, 1949.
8. BEST AND TAYLOR: *The Physiological Basis of Medical Practice*, 4th ed., Wm. Wood & Co., Baltimore.
9. BOURNE, A.: *J. Obst. & Gynec.*, 51: 251, 1924.
10. BOYD, D. A.: *Am. J. Obst. & Gynec.*, 43: 148, 335, 1942.
11. BREW AND STEINBERG: *J. Nerv. & Ment. Dis.*, 111: 5, 408, 1950.
12. BROCK, S.: *Am. J. Psychiat.*, 104: 579, 1948.
13. BROWNE, F. R.: *Antenatal and Postnatal Care*, Vol. 2, J. & A. Churchill, London, 1940.
14. BUCKNILL, J. C. AND TUKE, D. H.: *A Manual of Psychological Medicine*, 4th ed., 352, 1879.
15. CALWELL, N. E.: *Am. J. Obst. & Gynec.*, St. Louis, 2: 559, 1921.
16. COLLIER, J.: *Lancet*, 587, 642 and 687, 1928.
17. CONOLLY, J.: *Lancet*, 1: 349, 1848.
18. CRUICKSHANK, W. H.: *Canad. M. A. J.*, 43: 571, 1940.
19. DAVIDSON, G. M.: *Am. J. Psychiat.*, 15: 1331, 1936.
20. DEUTSCH, H.: *The Psychology of Women*, New York, 1945.
- 20a. *Idem*: *Problems of Infancy Care*, New York, 1948.
21. DIXON, W. C.: *Textbook of Pharmacology*, Edward Arnold, London, 1946.
22. DOAN, D. I. AND HOUSTON, P. E.: *Psychiatric Quart.*, 22: 413, 1948.
23. DOUTHWAITE, A. H.: *Hale-White's Materia Medica*, H. K. Lewis & Co. Ltd., London, p. 2, 7th ed., 1949.
24. DUNBAR, F. AND SQUIER, R.: *Psychosom. Med.*, 8: 161, 1946.
25. FELDMAN, F. et al.: *J. Nerv. & Ment. Dis.*, 103: 494, 1946.
26. FRIES, M.: *Psychosom. Med.*, 6: 159, 1944.
27. GOLDSTEIN, H. H.: *Am. J. Psychiat.*, 98: 201, 1947.
28. GOWERS, W. R.: *A Manual of Diseases of the Nervous System*, 2, 1901.

29. GRALNICK, A.: *Am. J. Psychiat.*, 102: 780, 1946.
30. GRAY, T. C.: *Brit. M. J.*, 1: 444, 1947.
31. HARRIS, J. S.: *Brit. M. J.*, 1: 835, 1936.
32. HUGGETT, H. ST. G.: Personal Communications.
33. HUGGETT, H. ST. G. AND PRITCHARD, J. J.: *Proc. Roy. Soc. Med.*, 38: 261, 1941.
34. JACKSON, M.: *Bull. Acad. Med.*, 16: 197, 1943.
35. JACOBS, B.: *J. Ment. Sc.*, 89: 375, 1943.
36. JAMES, G. B. W.: *Lancet*, 1: 515, 1935.
37. JARCHINE, R.: *Tr. Edinburgh Obst. Soc.*, 32: 165, 1906-7.
38. KALINOWSKY AND HOCH, P.: Shock Treatments and Other Somatic Procedures in Psychiatry, Grune & Stratton, New York, 1946.
39. KARNOSH, L. J. AND HOPE, J. N.: *Am. J. Psychiat.*, 94: 536, 1937.
40. KELLY, K.: *Psychosom. Med.*, 4: 211, 1942.
41. KENT, E. M.: *Psychiatric Quart.*, 21: 102, 1947.
42. WILSON, S. A. K.: Textbook of Neurology, H. K. Lewis & Co Ltd., London, 1947.
43. KOSMAK, G. W.: *New York State J. Med.*, 45: 2298, 1945.
44. KROGER AND FREED: Psychosomatic Gynaecology, W. B. Saunders, Phila., 1951.
45. Leading Article: *Brit. M. J.*, p. 431, Aug. 23, 1952.
46. MACLEOD, M. D.: *Brit. M. J.*, 2: 239, 1886.
47. MCCONNELL: *J. Ment. Sc.*, 91: 506, 1945.
48. MCILLROY: *Brit. M. J.*, 1: 303, 1928.
49. MILLER, G. B.: *Tr. Am. Gynec. Soc.*, Phila., 36: 409, 1911-12.
50. MOORE, M. T.: *Arch. Neurol. & Psychiat.*, 57: 693, 1947.
51. MORGAN, J. D.: *Med. Rec. New York*, 79: 623, 1911.
52. MORTON, J. H.: *J. Ment. Sc.*, 80: 64, 1934.
53. MOTT, SIR F.: *J. Ment. Sc.*, 68: 333, 1922.
54. MUNRO KERR, J. M.: Combined Textbook of Obstetrics and Gynaecology, Edinburgh, Wm. Wood & Co., Baltimore.
55. MUSKENS, L. J.: Epilepsy, London, p. 235, 1928.
56. NEEDHAM, J.: Biochemistry and Morphogenesis, Cambridge University Press, 1942.
57. NOYES, A. D.: Modern Clinical Psychiatry, W. B. Saunders, Phila., 1939.
58. ORGANE, G.: *Proc. Roy. Soc. Med.*, 40: 596, 1947.
- 58a. *Idem: Lancet*, 1: 21, 1949.
59. PARFITT D. N.: *J. Ment. Sc.*, 80: 43, 1934.
60. PATON, W. D. N. AND ZAIMIS, E. J.: *Nature*, 162: 8, 1948.
61. PAYNE, S.: *Brit. M. J. Psychol.*, 15: 18, 1935.
62. PIKER, P.: *Am. J. Obst. & Gynec.*, 35: 901, 1938.
63. POLATIN, P. AND HOCH, P.: *New York State J. Med.*, 1562, 1945.
64. Queen Charlotte Reports, 1949.
65. RANK: *Psychosom. Med.*, 10: 279, 1948.
66. READ, D. G.: *Lancet*, 1: 721, 1949.
67. SANDS, D.: *Brit. M. J.*, 2: 289, 1946.
68. SIMON, J.: *J. Nerv. & Ment. Dis.*, 107: 579, 1948.
69. SKOTTOWE, I.: *The Practitioner*, 148: 157, 1942.
70. SLATER, E. AND WOODSIDE, M.: Patterns of Marriage, Cassell & Co., London, 1951.
71. SMALLDON, J. L.: *Am. J. Psychiat.*, 98: 80, 1940.
72. SOLOMONS, B.: *J. Ment. Sc.*, 77: 701, 1931.
73. SPITZ, A. R.: Psychoanalytic Study of Child. II, New York International University Press, 1947.
74. STEINBERG, A.: *Psychosomat. Med.*, 8: 177, 1946.
75. STRECHER, E. A. AND EBAUGH, F. G.: *Arch. Neurol. & Psychiat.*, 15: 239, 1926.
76. STRUTHERS, J. A.: *Brit. M. J.*, 1: 18, 1931.
77. THORPE, F. T.: *Brit. M. J.*, 2: 281, 1942.
78. TURNER, C. C.: *Am. J. Psychiat.*, 103: 834, 1947.
79. TURNER, W. A.: A Textbook of Nervous Diseases, London, 1910.
80. UNWIN, J. D.: *Brit. J. M. Psychol.*, 15: 153, 1935.
81. WHITKOWER, E. AND WILSON, A. T. M.: *Brit. M. J.*, 2: 586, 1940.
82. WILCOX, P. H.: *Progress Neurol. & Psych.*, 2: N.Y., 1943.
83. WILLIAMS, D. I.: *Brit. M. J.*, p. 1263, June 14, 1952.
84. YOUNG, I. M.: *Lancet*, 1: 1052, 1949.
85. ZILBOORG, G.: *J. Nerv. & Ment. Dis.*, 68: 370, 1928.

## LAUGHTER IN ORGANIC CEREBRAL DISEASE\*

W. F. TISSINGTON TATLOW,  
M.D.(Lond.), M.R.C.P.,(Lond.), F.R.C.P.[C],  
Montreal

"The act of laughter, which is a contraction of the muscles of the face, and a pleasant agitation of the vocal cords is not merely voluntary or totally without the jurisdiction of ourselves."  
—Brown's *Vulgar Errors*, 1646.

PHYSIOLOGICALLY laughter is a co-ordination of rhythmical movements of the muscles of the face, jaw, throat, diaphragm, and neck; but those of the chest, spine and abdomen are involved too if the laughter is excessive. "Splitting the sides with laughter" describes quite vividly the involvement of the chest and abdominal muscles. A centre co-ordinating the rhythmical movement of these varied muscles is postulated, and some authors have stated that this centre is affected by impulses from various parts of the cortex.

Davison and Kelman (1939) stated that pathological laughing and crying could be found in cortical lesions involving the greater part of the cerebral cortex especially the frontal, premotor, motor and sensory cortex. Their first case not

only had softening in the left parietal region, but the basilar artery too was partially obliterated and a small area of softening was also observed in the medial nucleus of the left thalamus: the patient had pathological weeping after attacks of eye deviation to the right. Their second case with laughing and crying had telangiectasis in the right motor region; but the patient was aged 82, was unco-operative and petulant, and had moderate arteriosclerosis. Their third case occurred with a tumour involving the frontal lobe and corpus callosum: in their fourth case a glioblastoma of considerable size destroyed the motor, parietal, temporal and hippocampal convolutions and part of the pulvinar; this patient was unco-operative, euphoric with periods of irritability and crying. Their fifth case was a glioblastoma involving extensive areas including compression of the thalamic and hypothalamic nuclei: their last case of a tumour involving the paracentral lobule had uncontrollable attacks of crying relieved by operation. Except for their last case in which no autopsy was done, all of the patients' symptoms could have been due to involvement of basal structures, or to loss of higher control, and not to the cortical lesions *per se*.

Laughter has been described as occurring with the onset of hemiplegia by Badt (1937): and

\*From the Departments of Neurology at Queen Mary Veterans' Hospital and The Montreal General Hospital.



may occur prior to a temporal lobe seizure. It is of interest that laughter itself may produce an attack of cataplexy.

There is some evidence that the laughter "centre" is not directly affected by the pyramidal tract: for example, involvement of the cerebral cortex or internal capsule produces a facial paralysis on voluntary movement but the "emotional" movement remains; in addition, in bilateral cortical disease of these pathways there may be excessive laughing and crying in response to various emotional stimuli. Kinnier Wilson (1924) produced clinical material to show that the pathway to the lower centres of emotional expression passes close to the anterior and inferior surface of the thalamus, and that the fibres for emotional expression of the face decussated in the upper part of the midbrain and passed down in the tegmentum behind the pyramidal tract in the crus.

Bard (1934) suggested that strong emotions are subcortical and that the central mechanism lies in an area comprising the caudal half of the hypothalamus. Davison and Kelman (1939) described a number of cases with involvement of hypothalamus, thalamus and basal ganglia, in whom pathological laughter or crying had occurred: on the other hand paralysis of laughter with retention of emotional feeling in a patient with a hypophysial cyst has been described by Dott (1938). Animal experiments have given further evidence for the subcortical origin of emotional expression, for pleasant emotions were observed in cats after decortication by Rioch and Bremner (1938).

More recently Purdon Martin (1950) in describing four cases of "fits of sham laughter" which occurred without any recognizable emotional cause pointed out the proximity of the lesions to the hypothalamus. His first case occurred from a ruptured aneurysm arising in the basilar artery and extending into the interpeduncular space, compressing the floor of the third ventricle: his second case was a presumed vascular lesion at the base of the brain; and the third occurred from an aneurysm in the Circle of Willis. His last case was a presumed plaque of multiple sclerosis in the upper brain stem, but no postmortem was performed. Purdon Martin regarded these attacks of laughter as true fits due to an abnormal discharge from some motor centre but not excited by any physiological stimulus. It is of interest that one patient had

no recollection of the attack of laughter, and Purdon Martin continues with the observation that attacks of sham laughter were often of evil omen as regards prognosis.

#### CASE HISTORY

A French-Canadian man, aged 26, who was serving in the R.C.A.F. was admitted to Queen Mary Veterans' Hospital on August 10, 1952 in a stuporous state. He had reported sick a few days previously with a right frontal headache; but no abnormal signs were found and his blood pressure was recorded as 118/65. On the day of admission he had had a sudden weakness of his left arm and leg followed by unconsciousness: on examination at hospital there were no abnormalities in his cranial nerves except for a left lower facial weakness, and in his limbs there was a left-sided flaccid hemiplegia: a lumbar puncture showed normal pressure and cells with protein 50 mgm. %: no abnormality was found in his cardiovascular system to suggest an embolus.

On the following day the patient had recovered consciousness but was dysphasic: in a few days the speech became more understandable and it was noted that he had become very euphoric, was continually laughing and shouting without any marked stimulus and also was found to have excessive hunger, eating double or treble quantities of food. On enquiry the patient stated that he had always been left handed but that his family, so far as he knew, were right handed (this fact will be discussed later in relation to his laughter). During the succeeding weeks his left arm and leg improved rapidly, and by September 20 his arm had recovered to 50% and his leg almost completely returned to normal: but he still remained laughing without any adequate reason and it was considered to be a euphoric state. An electroencephalogram performed on August 13 had shown slow waves at 4-5 c/s over the right centro-temporal area mixed with alpha activity at 9-10 c/s: by September 2 there were only a few low voltage slow waves at 6 c/s over the same area indicating minor cerebral damage remaining. An arteriogram performed September 18 showed normal vessels in the right hemisphere.

The patient was eventually discharged on October 30, 1952 showing considerable improvement. He was seen again in the out-patient department in February 1953, having been discharged to civilian life: he entered the consulting room smiling broadly, and then stated he could not stop laughing: in his own words "I laugh too much". "I never had this laughing before". He stated that he had never previously had any trouble with his nerves, but since his hemiplegia he had "only to look at people and I start to laugh", he had found it very embarrassing in a streetcar because he started to laugh as soon as he entered and everybody then started to look at him as if he was "crazy". He stated that he occasionally laughed by himself or in bed, but that his main laughter outbursts occurred when he "saw people". He was able to distinguish a difference from the normal spontaneous laughter which occurred when he saw something amusing at the cinema; he said "when I laugh by myself, I don't feel it funny, it's a different sort of laughter". An interesting symptom, which was volunteered by the patient, was that he noticed a queer indescribable sensation over his left trunk when he had the abnormal laughter but this did not occur when he laughed at something amusing: and again the patient said "It doesn't mean I feel happy when I laugh because I don't". On enquiry he denied ever crying or feeling sad: in his own words "I never feel sad, and I've never cried since I was a baby".

Further examination in February 1953 had little to add to the patient's statement: it was noted in the ward that he laughed a great deal, usually without any adequate reason: examination of other patients would usually produce laughter from this patient often to the annoyance of the rest of the ward. Mentally the patient

showed no evidence of psychosis or behaviour disorder. Speech was considered very slightly abnormal in both French and English, and the patient appeared to have occasional difficulty in producing difficult or long words. Psychometric tests showed that on the Wechsler-Bellevue test "He was very co-operative but encountered much difficulty in performing the required tests. He was slow and cautious in his approach to the test situation. He has at least normal ability (verbal I.Q. 113 Performance 90 Full scale I.Q. 103) but the wide discrepancy between the verbal and performance tests suggests that his functioning is being impaired by his disability".

Physical examination showed no marked skull asymmetry and no difference in the size of the limbs. In his cranial nerves it was now noted that voluntary facial movement was poor on both sides, compared with spontaneous emotional expression, the only other abnormality being a reduction in quick side-to-side movement of his tongue. The motor power in his limbs was good, but his right side was now very slightly weaker than his left although the left was more spastic than the right with hyperactive reflexes and a left extensor response. His gait was normal, but his co-ordination was not absolutely perfect in the left arm. Routine sensory testing showed no abnormality, but it was found that there was a sensory suppression for pain sensation for the whole of the left side of the body: other functional tests for parietal lobe dysfunction showed no spatial disorientation or changes in body image and it was considered that the patient's copying and spontaneous drawing was within normal limits. A pneumogram showed fair filling of the lateral ventricles and for the most part not dilated: the septum pellucidum was not displaced: portions 1 and 2 of the right lateral ventricle were definitely wider than those of the left, portions 3 and 4 were equal. It was considered that there was local atrophy of the right frontal lobe.

The etiology of the patient's lesion is obscure, and no definite diagnosis was made although the differential diagnosis lay between embolus, thrombosis or possibly a demyelinating condition.

The only additional comment to be made on this young man's behaviour was a statement by a friend from his Unit that he had been "a little queer" previously, but unfortunately no further details are available. His behaviour, except for his laughter, was normal in the ward and after training in typewriting he was discharged to attempt gainful employment.

#### COMMENT

Sympathetic and parasympathetic effects are produced by activation of the autonomic system in emotion, and the experimental evidence to show that the site of excitation is in the posterior hypothalamus is reviewed by Gellhorn (1953). The cortex itself has an inhibitory effect on sub-cortical structures including the hypothalamus and Bard (1934) has shown experimentally that emotional hyperactivity occurs after decortication in animals: involvement of the cerebral cortex in humans is stated by some authors to give rise to release of affective responses, but the evidence for a unilateral lesion causing such release is dubious and it is probable that a bilateral cortical lesion is necessary before complete inhibitory control to the hypothalamus and diencephalic centres is removed.

The release of some centre, probably hypothalamic, from higher control by bilateral pyra-

midal disease is found in cerebral arteriosclerosis, motor neurone disease and multiple sclerosis. Pathological laughing and crying under these circumstances arises in response to almost any emotional stimulus, but the patient is then unable to stop laughing or crying, which continues without ceasing for some time afterwards. Fits of laughter, as described by Purdon Martin, are a little different from pathological laughing arising from cutting off of pyramidal control, because the attack of laughter arises like a bolt from the blue. Purdon Martin pointed out that the patients were surprised and even alarmed by their outbursts of laughter if they retained consciousness: he concluded that the attacks of laughter in his cases were the result of abnormal discharge of the cells of some centre lying close to the hypothalamus.

In this case the patient, who was left-handed, developed a sudden left-sided hemiplegia with aphasia: but it was considered that there was evidence of a previous minimal right-sided pyramidal lesion as shown by bilateral voluntary facial weakness, poor tongue movements and very slight right-sided motor weakness of the limbs as compared with the left. His right-sided pyramidal signs were minimal but were considered enough to produce (with his left hemiplegia) a bilateral loss of pyramidal control. The patient, in his own judgment had made a complete recovery except for his annoying laughter which had continued.

One unusual feature in this patient was that the laughter did not resemble that occurring from bilateral pyramidal disease, because it occurred spontaneously without any exciting emotional cause and was never associated with crying. Possibly the previous emotional make-up had some connection with the absence of crying, in so far as the patient denied ever having cried since babyhood.

#### REFERENCES

1. BADT, B.: *Zschr. f. d. ges. Neur. u. Psychol.*, 110: 297, 1927.
2. BARD, P.: *Handbook of Experimental Psychology*, Clark University Press, Worcester, Mass., 1934.
3. DAVISON, C. AND KELMAN, H.: *Arch. Neurol. & Psychiat.*, 42: 595, 1939.
4. DOTT, N.: *The Hypothalamus*, London, 1938.
5. GELLHORN, E.: *Physiological Foundations of Neurology and Psychiatry*, University of Minnesota Press, 1953.
6. MARTIN, J. P.: *Brain*, 73: 453, 1950.
7. RIOCH, D. M. AND BRENNER, C.: *J. Comp. Neurol.*, 68: 491, 1938.
8. WILSON, S. A. K.: *J. Neurol. & Psychiat.*, 4: 299, 1924.



## SUXAMETHONIUM BROMIDE: BREVIDIL-M A SHORT ACTING RELAXANT\*

R. F. OHLKE, M.D., C.M., F.A.C.A. and  
G. K. HOE, M.D., *Montreal*

THE REQUIREMENTS of the various clinic groups and hospitals for relaxants varies. At the Royal Victoria Hospital where most of the abdominal surgery is performed under spinal analgesia, there is not as much use for curare or curare-like substances as there is perhaps, in other centres.

However, in operations for teeth, tonsils, about the head and neck, and in abdominal sections where we believe that an endotracheal tube is desirable, then we do use one or other of the relaxants, to facilitate intubation and to provide continuous relaxation of abdominal musculature.

We sought an agent that would give us maximum relaxation, of short duration, that was relatively safe, free from side effects, and finally would be inexpensive. Several agents were given clinical trial but Brevidil-M† was chosen after extensive investigation as satisfying the requirements of our techniques better than those of the other drugs.

It must be mentioned here that Brevidil or any similar drug should not be given unless the administrator has the equipment and the experience necessary to cope with the apnoea which will probably ensue.

**Chemical and physical properties.**—Brevidil-M brand of suxamethonium bromide is chemically bis (2-dimethyl aminoethyl) succinate bis methobromide.

Molecular weight 450 — Melting point 225° C.

It occurs as a colourless crystalline powder which is slightly hygroscopic. It is readily soluble in water or normal saline giving solutions which are very slightly acidic. Aqueous solutions undergo progressive hydrolysis with corresponding loss of activity and increase in acidity. The rate of this decomposition increases with temperature and consequently autoclaving or prolonged exposure to warmth should be avoided. When solutions of suxamethonium are mixed with alkaline solutions of Pentothal Sodium or other intravenous barbiturates, a precipitate of barbituric acid is formed, which redissolves when more Pentothal Sodium or other alkali is added. Such solutions rapidly lose activity to the extent of 20% within five minutes. If mixed solutions of this type are required, they should therefore be used immediately.

**Nomenclature.**—Because of the variety of trade names and the different salts of these compounds which are now in use, there is need for:

(a) common names which will indicate the resemblances and points of differences between them. The term "succinyl choline" is chemically inaccurate and the name suxamethonium has therefore been devised. (b) A universally applicable means of indicating and comparing dosages. Since equi-effective doses of different salts of the same active compound vary according to their molecular weights, it appears logical to express dosages in terms of *active cation*, i.e. suxamethonium.

**Pharmacology.**—In mammals suxamethonium has a very selective action in blocking the transmission of impulses across the neuromuscular junction of striated muscles in a manner resembling that of decamethonium but differing from that of d'tubocurarine and gallamine triethiodide (Flaxedil). This neuromuscular block is rapidly reversible, reproducible on repeated administrations and probably non-cumulative. It is further characterized by: (a) a transient preliminary acetylcholine-like stimulation; (b) a rapid onset and progression to complete block; (c) short duration which is only partially related to dosage; (d) rapid regression from complete block to normal activity; (e) being potentiated experimentally by certain drugs with anticholinergic activity.

This compound is practically devoid of intrinsic toxicity and side effects are only seen experimentally when massive doses are given to artificially respired animals. It would appear to be rapidly inactivated in the blood and other body tissues by enzymatic hydrolysis, probably to choline and succinic acid, and in this respect it differs from d'tubocurarine, gallamine triethiodide and decamethonium which are excreted unchanged. (4) It provokes no significant histamine liberation. Brevidil-M is supplied in dry powder form which retains the potency and requires no refrigeration; (a) ampoules containing 60 mgm.; (b) vials containing 300 mgm. or 750 mgm.

### USE AS A RELAXANT TO FACILITATE INTUBATION

This agent has been used in several hundred cases to ensure adequate relaxation and optimum conditions for endotracheal intubation.

We mix our relaxant with Pentothal Sodium just prior to venipuncture. The technique is as follows: 20 c.c. of 2½% Pentothal is prepared and drawn into an eccentric-tipped syringe which

\*From the Department of Anaesthesia, Royal Victoria Hospital, Montreal, Que.

†Brevidil-M is produced and supplied by Poulenc Ltd.

is fitted with a 20 gauge needle. Immediately before venipuncture the ampoule of Brevdil is opened and the powder dissolved in one c.c. of our Pentothal solution and the whole then drawn up into the syringe. Injection is immediately carried out and the amount given varies with the age and condition of the patient. This amount varies from 5 c.c. of the mixture for a five year old child to 20 c.c. for a robust adult male. The speed of injection is twenty to thirty seconds.

The length of the waiting period is usually twenty to thirty seconds and varies with the size of the dose, the speed of injection and the concentration of the solution used. The circulation time is an additional variable.

The patient then passes into the phase of muscle stimulation which may last up to thirty seconds. This is due to commencing and progressive muscle membrane depolarization at or near the motor end-plate regions and comprises diffuse unco-ordinated fibrillations and contractions in muscle bundles and groups with or without spatial displacement. It is first apparent in the head and neck regions, and serves as a sign of impending paralysis. This stage is less marked if the injection is made slowly. The effect is maximal at or soon after the onset and is generally sufficiently complete to give apnoea and complete relaxation for three to five minutes and ideal intubation conditions for two to three minutes.

The recovery period after the first spontaneous respiration is complete in about four to five minutes. We have had four cases of prolonged apnoea with this agent, all of which recovered completely within thirty minutes without other treatment than artificial respiration carried out by manual compression of the breathing bag.

In spite of the fact that all our patients receive adequate doses of either scopolamine or atropine we have had several cases of excess salivation or "drooling". In this respect Brevdil was no worse than any of the other agents and much better than some.

We found that relaxation was adequate in all cases, with the vocal cords relaxed in full abduction. In two cases where intubation was extremely difficult due to deformity of jaw or contracture of neck, a repeated dose of 60 mgm. of Brevdil given when the first had worn off enabled a successful intubation and without adverse effect.

No patient complained of any discomfort on awakening, despite the fact that we give our relaxant mixed with Pentothal Sodium. Recovery is so rapid, that unless intubation is followed by some potent agent such as cyclopropane the patient will "buck" on the tube.

*Continuous intravenous infusion method.*—Because of its very short duration of action, muscle relaxation may be maintained from a few minutes to several hours by giving the drug continuously via the intravenous drip method. Recovery of muscle tone begins immediately after cessation of the infusion and this is complete in from three to six minutes. This close control of action of Brevdil renders the drug suitable for practically all procedures requiring relaxation of skeletal muscles which includes almost all major operations and short surgical procedures and manipulations.

Strength of the solution favoured is 0.1% in 5% glucose and water or in sterile isotonic saline: that is, 500 mgm. Brevdil dissolved in 500 c.c. of vehicle. With saline, one may drip it simultaneously with blood. The desired degree of relaxation is obtained by allowing the solution to drip at a rate of approximately 3 to 6 c.c. per minute. However the amount required varies with the individual. If one wishes to restrict fluid intake, one may concentrate this relaxant mixture to a 0.2% solution. By altering the rate of flow the degree of muscle relaxation may be changed within one minute to suit the situation.

Excellent results have been obtained using continuous Brevdil drip in the following surgical procedures where relaxation is as important as the anaesthetic for the success of the operation.

(a) Abdominal surgery including bowel and gastric resections which require from two to five hours. Patients are intubated under Pentothal-Brevdil mixtures and maintained with cyclopropane or Pentothal and nitrous oxide anaesthesia. Brevdil drip is infused continuously to give the maximum relaxation at the opening of the peritoneum, during the exploration and the closure of the abdomen. Should Brevdil produce apnoea, respiration must be controlled until spontaneous breathing begins. We have used Brevdil in amounts up to 1,500 mgm. with no untoward effects.

In acute abdominal emergencies where the patient is in a shock state with intra abdominal haemorrhage, dehydration through prolonged obstruction and also in the debilitated and the



aged, the use of the continuous Brevidil infusion for muscle relaxation has been satisfactory. Of course the amount of Brevidil required for relaxation in such patients is considerably less than in patients who are healthy and robust.

(b) As a supplement to a spinal anaesthetic that is wearing off where relaxation is required for the closure of the peritoneum. The patient is anaesthetized to a light plane of anaesthesia with pentothal drip or nitrous oxide or both before Brevidil infusion is begun to give the required degree of relaxation.

(c) In oesophagoscopy this is a relatively short procedure but one requiring a maximum degree of relaxation which must be attained either by deep anaesthesia or by the use of curare which has a prolonged effect. With the use of Brevidil drip, the patient need only be intubated with a sleeping dose of Pentothal-Brevidil. He is maintained under  $N_2O - O_2$  (4:1 mixture) which is adequate anaesthesia and the relaxation necessary is obtained by use of the continuous Brevidil drip. At the conclusion of the procedure and upon extubation, the anaesthetic will have worn off and muscular control resumed. Thus the maximum relaxation under a light plane of anaesthesia is obtained without any particular untoward effects on the patient.

(d) In bronchoscopy this is similarly a short procedure but decidedly more difficult since the anaesthesiologist has no control of the airway. The object here is threefold: (1) Depression of the pharyngeal and laryngeal reflexes by adequate cocaineization. (2) Relaxation of the jaw and cervical muscles without paralysis of the diaphragm. (3) Adequate anaesthesia without central depression of the respiratory centre.

The patient is usually maintained under light anaesthesia with intermittent 2.5% Pentothal and Brevidil is infused until relaxation is adequate to admit the scope. The cough reflex is depressed but without respiratory arrest.

#### CONCLUSIONS

Suxamethonium bromide has been described both as an agent to facilitate intubation and also, when given by the drip method to provide continuous relaxation.

We have found the drug to be relatively free from side reactions, satisfactory for the purposes used, economical and to satisfy all the requirements of the techniques used at this hospital. Brevidil has been used in over 500 cases.

#### RÉSUMÉ

Les curarisants synthétiques sont particulièrement utiles comme adjuvants de l'anesthésie rachidienne, ou dans les cas où celle-ci ne peut être pratiquée. Après en avoir essayés plusieurs, le département d'anesthésie de l'hôpital Royal Victoria a adopté le "Brevidil-M" (Suxamethonium fabriqué par la maison Poulenc Ltée.) Ce produit agit au niveau de la jonction neuromusculaire et interromp temporairement la transmission de l'influx nerveux. Il perd rapidement ses propriétés au contact du sang. Il est présenté sous forme de poudre que l'on dissout habituellement dans une solution de Pentothal ou dans une solution intraveineuse en concentration de 0.1% ou 0.2% (sérum physiologique, glucose 5%, etc.) administré à raison de 3 à 6 c.c. à la minute, selon les circonstances. Certains malades ont reçu jusqu'à 1,500 mg. sans suites fâcheuses. Il provoque d'abord de la fibrillation musculaire et des contractures généralisées mais de peu d'amplitude, suivies de près d'une action antitonique et de paralysie. On ne doit jamais l'employer sans être prêt à combattre l'apnée. La salivation qu'il produit est due même ordre que celle causée par des agents semblables. L'intubation endotrachéenne est grandement facilitée par le relâchement complet des cordes vocales. Le "Brevidil-M" est couramment employé en bronchoscopie, oesophagoscopie et en chirurgie abdominale, quand les interventions peuvent durer plusieurs heures.

M.R.D.

#### THE TREATMENT OF PIGMENTED NEVI\*

SAUL S. BERGER, B.A., M.D., Winnipeg

THE TERM PIGMENTED NEVI will be limited to lesions of the skin which histologically are characterized by nevus cells or cells derived from dopa-positive melanoblasts or potential melanoblasts. The nevus cell may be described as an oval or cuboidal cell having a large oval vesicular

nucleus. The histopathological changes vary greatly depending on the character and the arrangement of the nevus cells. A melanoblast is simply a term designated by Bloch as a cell with pigment forming potential. Melanoblasts contain the enzyme dopa oxidase or melanogenase which is used in the intracellular manufacture of the pigment melanin. Melanogens circulating in the blood stream act on the cell containing the enzyme dopa oxidase or melanogenase to form pigment.

Bruno Bloch placed frozen sections of tissue containing melanoblasts in a 1% solution of 3-4

\*Presented at the Seventh Annual Meeting of The Canadian Dermatological Association, Devil's Gap Lodge, Kenora, Ontario, June 15, 1953.

dihydroxyphenylalanine (dopa). Cells containing the enzyme dopa oxidase or melanogenase will convert the colourless dopa to dark and soluble melanin and are therefore called dopa-positive cells. Allen<sup>1</sup> points out that not all the neoplastic cells of nevus or melanomas have the enzyme, possibly because of its use in the fabrication of pigment, its dissipation with time, its total absence, or its existence in undetectable traces in rapidly growing melanomas. Also a melanoblast may be pigmented or nonpigmented depending on whether the enzyme has reacted with the circulating melanogens.

This paper will exclude a consideration of lesions designated as nevus in a wide dermatologic sense *i.e.* any congenital mark or blemish. There is still much interest in pigmented nevus. The chief reason of course, is because of its relationship to melanomata. It is disconcerting that there is no uniform opinion in the medical profession as to the correct management of these nevi. One reason for the differences of opinion is because we do not know all there is to know about them, and until we do, differences of opinion serve as stimuli for further research and investigation. It is true in medicine as elsewhere that "Where everyone thinks alike, no one thinks very much". The classification of nevus as outlined by Allen<sup>1</sup> will be used. It is a histologic classification.

#### TYPES OF NEVUS

1. Intradermal nevus (common mole or neuro nevus).
2. Junctional nevus (dermoepidermal or marginal nevus).
3. Compound nevus.
4. Blue nevus (Jadassohn-Tièche Nevus).
5. Juvenile melanoma.

Becker, Traube, Keil and others are in essential agreement with this classification. You will note that the so-called intra-epidermal nevus is excluded from this classification. It is mentioned because some men include it in a classification of pigmented nevi. No nevus cells are found in these lesions. The history and clinical picture, however, may be suggestive of a nevus. As the classification of nevus outlined is based purely on histological appearance let us deal briefly with the histological picture of each of the five types of nevus mentioned above.

*Intradermal nevus.*—Here the nevus cells are present in the dermis but there is no attachment of nevus cells to the epidermis. This lesion is what is referred to as the common mole or

neuro nevus. As Allen<sup>1</sup> points out the individual cells have nuclei of relatively uniform size and circular shape. The nuclei are moderately vesicular with fine chromatin granules and usually one small nucleolus. The nevus cells, particularly the deeper ones, may be entirely devoid of pigment, but often round granules of melanin are present in the cytoplasm of the most superficial cells.

*Junctional nevus.*—This lesion is one in which there is an attachment of nevus cells to the epidermis and where the nevus cells are integrated with the epidermis.

*Compound nevus.*—The compound nevus is where along with intradermal clusters of nevus cells, there is an associated overlying junctional change, that is, there are also junctional nevus cells along with intradermal nevus cells.

*Blue nevus.*—Ormsby and Montgomery<sup>7</sup> believe the histologic picture is diagnostic. Typically the blue nevus, as they point out, is composed of spindle shaped melanoblasts grouped in irregular masses in the lower 2/3 of the cutis. Allen<sup>1</sup> states that the cells may be confined to the upper dermis and may be directly adjacent to the epidermis. The individual cells are spindle shaped and are arranged in whorls simulating neurofibromas. There are few mitotic figures.

*Juvenile melanoma.*—As Allen<sup>1</sup> points out juvenile melanoma are lesions occurring before puberty which do not behave as malignant lesions but have the histological characteristics of a melanoma. Therefore, they are called juvenile melanomas. Histologically, the lesions show prominent junctional changes. Mitotic figures are found in most instances. Occasionally, one may see large multinucleated cells with a single huge moderately vesicular nucleus.

You will note that the word "lentigo" has not been mentioned in this classification. Allen<sup>1</sup> states that the term "lentigo" and the term "lentigo maligna" as used by dermatologists appear to refer respectively to early and advanced stages of the junctional nevus.

Before discussing the practical aspects of treatment of pigmented nevus, there are four points which must be discussed.

- (a) Does the intradermal nevus or common mole give rise to malignant melanoma?
- (b) The question of trauma to nevus and its relationship to melanomatous formation.
- (c) The question of danger of biopsy of a potentially malignant or malignant lesion.
- (d) How can we be certain of the type of nevus we are treating or plan to treat?



*Does the intradermal nevus or common mole give rise to malignant melanoma?*<sup>2</sup>—It is not the scope or intention of this paper to even summarize the vast supporting evidence that the common mole or intradermal nevus does not give rise to malignant melanoma, but a few authorities and their work will be cited. A. C. Allen<sup>1</sup> states that the purpose of his paper is essentially to show that "the evidence points to the epidermis in the form of the junctional nevus rather than to the intradermal mole as the source of the melanoma". In his summary he states:

"The evidence contradicts the impression that malignant melanoma arises from the common mole or intradermal nevus. When as occurs in the minority of instances, a common mole is associated with a melanocarcinoma, the latter may be assumed to have grown from the overlying epidermal or junctional element of the compound nevus rather than from the intradermal nevus".

Allen subscribes to the epidermal theory for the origin of cutaneous nevus and malignant melanomas. He offers sound histologic proof in supporting this theory. He microscopically demonstrates the change from benign to malignant in individual lesions and thus he has clearly implicated the junctional nevus as the exclusive precursor of the melanoma. The neurogenic theory of the derivation of common moles (or nevus) and their supposed counterparts, the malignant melanoma, as he states, is the more widely accepted by far. But he explains that such well known advocates of the neurogenic theory of origin of moles and malignant melanomas as Masson and Becker acknowledge the epidermal location of these nevus and melanoma cells. Becker<sup>2</sup> states that in his experience, and that of Saperstein, Montgomery, Kernohan and others, melanoma originates at the junction of the epidermis and the dermis in cells that are intimately attached to the epidermis. Traube and Keil<sup>12</sup> state:

"Malignant melanoma apparently have their origin in nevus of the junctional type." Further they state: "We find no evidence that the mole that is characterized histologically by intradermal collection of nevus cells ever develops into cancer."

*The question of trauma to nevus and its relationship to melanomatous formation.*—Obviously as a corollary of what has been discussed previously, this question need not be considered. To repeat, one need not worry about the intradermal nevus undergoing malignant transformation. Daniel P. Slaughter<sup>10</sup> states:

"There is considerable mythology and misunderstanding about the treatment of moles. There is much popular fear that disturbing a mole in any way may be dangerous. In my personal experience, and in the literature, there is no authenticated instance of a benign neuro nevus becoming malignant after incomplete removal with the electric needle, cautery or excision."

They therefore can be treated by carbon dioxide snow, trichloroacetic acid, etc. One does not have to fear for malignancy. In other words, one can state emphatically that melanomas do not originate in the intradermal nevus, and trauma to intradermal nevus does not give rise to melanomata. Since this paper rests on the premise that junctional nevi give rise to melanomata then one should rather attempt to consider the question of trauma to junctional nevus and its relationship to melanomatous formation.

It has never been proven that trauma to junctional nevus has been a cause of melanomatous formation. Neither, however, has it been demonstrated or proven conclusively that trauma to junctional nevus is not a factor in inciting these nevi to melanomatous formation.

A. H. Wells<sup>13</sup> states:

"The six principal etiologic factors in the development of melanomata are: nevus, heredity, hormones, trauma, skin colour and age." With regard to trauma he states, "There is almost unanimous agreement concerning the relationship between trauma and the origin of the melanomata, yet much of the evidence is based upon unscientific data. There is to my knowledge no histologic proof that melanomata have resulted from incomplete removal of a nevus."

One can state that since we believe that it is the junctional nevi that give rise to melanomata, therefore it would be unwise to treat the junctional nevus with methods considered traumatizing, or one would be foolish to disregard trauma in any form as a factor in causing the transformation of junctional nevus to melanomatous formation.

Certainly, if trauma may prove to be a factor in inciting a junctional nevus to melanomatous formation, it is not the only factor responsible. One must consider that the incidence of junctional nevus is very high and the incidence of melanoma is very low. On the face, there is a high percentage of junctional nevus. Surely many of these nevi have been treated by electrologists, cosmeticians, and physicians with methods considered traumatizing. Also, consider the trauma of shaving and irritation which the face receives. Why, then, is not the incidence of malignant transformation of junctional nevus to melanomata greater than it is? As Allen<sup>1</sup> states:

"In the case of the junctional nevus, there is lacking a properly required statistical and histological proof, that trauma transforms a junctional nevus into malignant melanoma, even though intuitive support of such a thesis is understandable." Further,<sup>1</sup> he states, "In the case of the much traumatized feet where melanomas are common, the factor of repeated irritation has been accorded considerable weight in the provocation of melanomas. However, in establishing this point of view, the selective fact seems not to have been taken into account that the nevi on the soles of the feet are just about exclusively of the junctional or pre-cancer type in contrast to most other parts of the body. In other words, one is led to wonder if in the absence of trauma, junctional nevi of the feet would not maintain their incidence of degeneration into melanomas."

For the present, however, and in order to guide us in our therapy, we must consider that trauma to a junctional nevus is dangerous in spite of the fact that statistical or histological proof of this is lacking.

*The question of danger of biopsy to a melanoma.*—Becker,<sup>2</sup> states:

"It is my belief that the removal of specimens for biopsy is entirely safe if the physician is prepared to carry out further measures within a week or so. I believe that the old idea that the removal of tissue for biopsy encourages the metastases of malignant lesions is fallacious. The inflammatory reaction following the removal of tissue for biopsy seals the local lymphatics and temporarily discourages, rather than encourages dissemination." Arthur H. Wells,<sup>13</sup> writes: "Contrary to the general opinion, biopsy probably inhibits the spread of malignant skin lesions because the inflammatory reaction set up by the trauma occludes the lymphatics."

Woolner and McDonald<sup>15</sup> state: "Any theoretical danger of disseminating tumour cells by a properly performed biopsy has not been substantiated by clinical or experimental evidence. They refer to the experiment of F. C. Wood<sup>14</sup> who inoculated white rats with the Flexner Jobling rat carcinoma, an adenocarcinoma which frequently metastasizes to lungs, blood vessels and regional lymph nodes. Wood concludes from his experiments that in white rats bearing the Flexner Jobling rat carcinoma metastasis is not increased when the tumour is incised, a fragment removed aseptically, and the growth allowed to remain in the animal for ten to twelve days thereafter. Peterson and Nuttal<sup>8</sup> in a carefully controlled clinical experiment showed that the incidence of metastasis is not increased by biopsy of squamous cell carcinoma, but stated that no generalization about other tumours can be made from this experiment.

Maun and Dunning<sup>4</sup> in their experimental work show that no untoward effects are recorded by cutting into malignant tumour masses or by severing lymphatic channels. A study of data reported by them suggests that the treatment

of a neoplasm is facilitated by the removal or destruction of a quantity of the growth and that the host's survival is thereby proportionately prolonged.

From this it may be concluded that the removal of specimens for biopsy is an entirely safe procedure if one is able and prepared to carry out further measures within a week or so.

*How can we be certain of the type of nevus we are treating or plan to treat?*—It follows from what has just been said that it is extremely important to be certain of the type of nevus we are treating. I do not believe that even the most expert of us should rely or take a chance on deciding clinically what the histologic picture of a nevus is. I believe it is hazardous to treat any pigmented nevus of the skin without any pathological evidence of its nature. Let us list our nevi according to histologic classification and then let us see what may be their clinical picture.

Traub and Keil<sup>12</sup> give the following classification.

#### INTRADERMAL NEVUS

Marks which may be clinical examples are:

- (a) Verruca mollis, (soft wart or cellular nevus (the "common mole").
- (b) Nævus papillomatosus, (generally refers to a soft warty nevus).
- (c) Lentigines, deep (?) (the so-called beauty mark seen frequently on the face.)
- (d) Nævus pigmentosus et pilosus (pigmented mark with hair.)
- (e) Nævus pigmentosus et verrucosus (soft warty pigmented mark.)
- (f) Nævus pigmentosus et pilosus et verrucosus (combination of pigmented hairy and soft mark.)

#### JUNCTIONAL OR BORDERLINE NEVUS

Marks which may be clinical examples are:

- |   |  |
|---|--|
| <ol style="list-style-type: none"> <li>(a) Nævus spilus (small smooth flat pigmented spot.)</li> <li>(b) Nævus pigmentosus</li> <li>(c) Lentigines               <ol style="list-style-type: none"> <li>(1) superficial</li> <li>(2) deep</li> </ol> </li> <li>(d) Nævus pigmentosus et verrucosus (exceedingly rare; when it occurs it may represent a combination type.)</li> <li>(e) Nævus pigmentosus et pilosus (exceedingly rare.)</li> </ol> | clinically may be indistinguishable from those which microscopic examination would place in another group. |
|---|--|

*Blue nevus.*—Clinically, the mark is probably often mistaken for a slate black mole (malignant melanoma). It may be dark brown, slate or blue-gray in colour and is usually smooth and hairless, flat or slightly elevated.

*Compound nevus.*—Represents clinically a combination of the above types mentioned. Allen<sup>1</sup> states that there is nothing about the clinical appearance to suggest that the common mole has been compounded with the junctional nevus until the latter becomes active.



*Juvenile melanoma.*—Allen<sup>1</sup> points out it may be hairless, elevated or verrucous and rarely is ulcerated. Colour varies from light pink to deep brown.

It is obvious from the above that there are no clear-cut clinical criteria with which to judge what a nevus is histologically. I therefore believe it is an absolute necessity in treating a nevus by any method we choose or for any reason we have, that we obtain histologic proof of the nature of that nevus.

Our considerations in the treatment of pigmented nevus will then rest upon the following principles:

(a) That the intradermal nevus (common mole) does not give rise to malignant melanoma.

(b) That one must consider it is the junctional nevus that gives rise to malignant transformation and therefore, until the relationship of trauma with regard to junctional nevus is settled, we shall regard traumatizing procedures and incomplete removal of the junctional nevus as dangerous. There is, however, no danger involved in biopsying a junctional nevus, that is, removing a part of it, if one is prepared to excise it completely within a few days.

(c) That there is no danger in biopsying a melanoma if one is prepared to do wide excision within a few days.

(d) That since we cannot be certain from clinical appraisal of the type of nevus we plan to treat we should biopsy all nevi before removing or destroying them.

#### PRACTICAL CONSIDERATIONS IN TREATMENT

Let us now proceed to the practical application of what has been said in relationship to the treatment of pigmented nevus. It seems to me there are only two reasons why the patient visits or should visit a doctor about his pigmented nevus. (1) For cosmetic reasons: The patient simply wants the lesion removed because the patient feels it will improve his appearance. (2) Because the patient feels the lesion is dangerous or the doctor may advise the patient of its danger.

(1) Are we justified in removing moles for cosmetic reasons? We definitely are if we take into account four factors:

(a) Are we achieving a better cosmetic result with our method of therapy and will this result be cosmetically more attractive than if we left the

mole untreated regardless of the patient's wishes in this matter?

(b) Can we be certain in treating the nevus that we are not contributing to the activation of that nevus to malignancy?

(c) Can we be certain that by not treating the nevus we are not leaving the patient with a potentially malignant lesion?

(d) Also let us not forget that in our treatment a biopsy is an essential requirement.

Let us consider methods of therapy bearing in mind the four factors listed above. I agree with Hamilton Montgomery<sup>6</sup> of the Mayo Clinic when he states: "If the pigmented or non-pigmented nevus is of fair size, surgical excision following the lines of cleavage of the skin gives the best results." This method of therapy satisfies all four factors mentioned.

If the report from the pathologist states: Intradermal nevus, Junctional nevus, Compound nevus, Blue nevus or Juvenile Melanoma, we have no worry and no further treatment is required as long as we have completely removed all the nevus cells. If the report comes back: malignant melanoma, then we must carry out further therapy, discussion of which is beyond the scope of this paper. I also agree with Montgomery<sup>6</sup> who states that for the small lesion electrosurgery with or without curettage is satisfactory. James T. Mills<sup>3</sup> of Dallas states, "The removal of the small mole can certainly be taken care of very nicely by the dermatologist as well as the plastic surgeon".

*Cautery and electro surgical treatment of moles.*—We must satisfy ourselves that we are fulfilling by these two methods the four factors mentioned. To fulfill the four requirements and still employ electrosurgery or cautery I believe that these two methods of removal of nevus are applicable only to the raised or so-called papular nevus with or without hair. I employ for these nevus the method advocated by Becker.<sup>2</sup> *The raised non-hairy nevus:* He snips off with scissors the most superficial portion of the lesion for subsequent biopsy. The area is then cauterized with electro cautery to such a depth that when the wound is healed, the scar will be flush with the epidermal surface. No attempt is made to destroy all the dermal cells, as in Becker's experience they are all harmless. With this method, one can achieve an excellent cosmetic result. *The raised hairy nevus:* This of course may be treated by surgical excision or it may be treated electro-

surgically using Becker's technique. He treats them in two ways: First, a specimen from the lesion may be taken for biopsy and the lesion cauterized at the initial visit with subsequent removal of the hair by the epilating needle if hair recurs. Or secondly the hair may be first removed by the epilating needle. Then, a specimen for biopsy is taken from the nevus and the mole cauterized at the first visit. Removal of the hair with the epilating needle without subsequent immediate treatment of the nevus is not considered safe. If the report from the pathologist concerning the nevus with or without hair states dermal nevus, nothing further need be done. If the report states junctional nevus, I prefer to excise around the area treated, even though all junctional nevus cells are probably removed initially, although one cannot be 100% certain. If the report is juvenile melanoma surgical excision is indicated and if the report states melanoma, we have done no harm, but must carry out further measures.

I do not believe electrosurgical treatment should be used for any flat nevus because this method does not lend itself to biopsy without producing a bad cosmetic result. If one sacrifices the biopsy, and attempts to remove all the nevus cells, this usually results in a depressed pigmented scar which is unsightly, and still one cannot be absolutely certain without a biopsy that we are not dealing with a melanoma. Slaughter<sup>10</sup> writes in this regard,

"Dermatologists have removed thousands and thousands of moles with acid, carbon dioxide snow, electrocautery and so on without untoward occurrences. The removal of moles on the face for cosmetic reasons by these methods would seem to be perfectly safe. There are two disadvantages to such procedures: (1) No tissue is removed for microscopic section. (2) The destruction of the lesion is almost always incomplete. This is because total removal would leave an unsightly scar and usually a compromise is made with cosmetic considerations."

(2) The other reason why the patient wishes a mole removed is because he feels it is dangerous or has been told by his doctor that it is a danger. One should say at the outset that it is impossible to determine clinically the presence of malignant change. There are however, several factors that should immediately arouse our suspicion. These have been excellently reviewed by Harvey C. Roys.<sup>9</sup> They are: (1) Change in colour or size of the lesion. One should remember that the absence of pigmentation does not rule out a melanoma. (2) Erosion, bleeding, weeping, crusting, or ulceration. (3)

Frequent injury or secondary infection. (4) Increase in vascularity. (5) Pruritus or pain. (6) Lesions of the extremities especially subungual lesions should arouse suspicion. Any pigmented lesion on the palms, the soles or skin of scrotum should be removed. (7) Regional lymphadenopathy or metastases are late signs of malignancy.

In addition to these seven suspicion-arousing factors, one should add the acquisition of any brown spot after puberty, especially if it has been enlarging slowly or rapidly and unevenly and shows various degrees of light and dark brown colour. Becker<sup>3</sup> believes that clinically melanoma originates in 75% of cases as a brown macule which has appeared after puberty. He cautions however, that pigmented nevi enlarge as a person becomes older, become slightly darkened and if injured sufficiently will bleed. But that a nevus in which melanoma has developed, enlarges more rapidly, becomes more deeply browned or tends to bleed on slight trauma. It should be mentioned that the most frequent signs of activity of a nevus are growth, increasing pigmentation and irritation, infection, bleeding and ulceration. If any of these suspicion-arousing factors are present the nevus should be removed. Complete surgical excision with histopathological study of the nevus is recommended for all nevi that present to the observer any sign of activity or in which there are factors that may lead to activity. The consensus is for reasons mentioned previously that moles at the site of irritation should be removed preferably before puberty. If one is going to treat what clinically is suggestive of a junctional nevus complete surgical excision is recommended. Also, as Marion B. Sulzberger<sup>11</sup> states, "If in doubt as to the nature, activity or future of the nevus, surgical excision is desirable." Surgical excision has the advantage of removing the entire lesion. One may require study of many microscopic sections before a diagnosis is complete. If one examines only one or two sections of any early lesion, one is running the risk of an incorrect diagnosis. For a benign junctional change may lie in close approximation to a malignant melanoma.

#### SUMMARY

1. Nevi are classified histologically.
2. Mention is made of the literature and work offering evidence that the intradermal nevus never gives rise to malignant melanoma.



3. The question of trauma to nevus and its relationship to melanomatous formation is discussed.

4. The junctional type is considered the precursor of the malignant melanoma.

5. Biopsy of a melanoma is in itself not dangerous.

6. There are no clear-cut clinical criteria by which to judge the histological nature of any nevus.

7. The importance of biopsy as a part of the procedure in treating nevi whether for cosmetic reasons or because of factors that are suggestive of malignancy, or that may contribute to malignancy, is stressed.

8. A consideration of the problems centering about the removal of nevus for cosmetic reasons only is discussed.

9. A consideration of the factors in nevus which should arouse suspicion of malignancy is outlined.

10. A plea is made for early surgical excision of all nevi which show any signs of activity or where there are factors that may lead to activity.

#### REFERENCES

1. ALLEN, A. C.: *Cancer*, 2: 28, 1949.
2. BECKER, S. W.: *Arch. Dermat. & Syph.*, 60: 44, 1949.
3. *Idem*: *Minnesota Med.*, 34: 1153, 1951.

4. MAUN AND DUNNING, W. F.: *Surg., Gynec. & Obst.*, 82: 567, 1946.
5. MILLS, J. T.: The Schoch Letter, March 1951.
6. MONTGOMERY, H.: The Schoch Letter, March 1951.
7. ORMSBY, O. S. AND MONTGOMERY, H.: *Diseases of the Skin*, Lea and Febiger, 7th ed., p. 765, 1948.
8. PETERSON, R. AND NUTTAL, J. A.: *Am. J. Cancer*, 37: 64, 1939.
9. ROYS, H. C.: *Northwest Med.*, 51: 221, 1952.
10. SLAUGHTER, D. P.: *Surg. Clin. North America*, February, 1948.
11. SULZBERGER, M. B.: The Schoch Letter, March 1951.
12. TRAUB, E. F. AND KEIL, H.: *Arch. Dermat. & Syph.*, 41: 214, 1940.
13. WELLS, A. H.: *Minnesota Med.*, 33: 456, 1950.
14. WOOD, F. C.: *J. A. M. A.*, 73: 764, 1919.
15. WOOLNER, L. B. AND McDONALD, J. R.: *Surg. Clin. North America*, August, 1951.

203 Professional Bldg.

#### RÉSUMÉ

Les nævi sont classifiés sur une base histologique. Le nævus intradermal n'est jamais susceptible de se cancériser. Les principaux auteurs qui ont soutenu et prouvé cette assertion sont cités dans le texte. La question des facteurs traumatiques dans la transformation d'un nævus en nævocarcinome, est discutée. Le nævus pigmentaire type dit "de jonction" des auteurs américains, est considéré comme le précurseur du nævocarcinome. La biopsie de tissu nævique, en elle-même, n'offre aucun danger. On ne peut deviner par des moyens uniquement cliniques, la structure cellulaire d'aucun nævus. L'importance de la biopsies dans le traitement de nævus, que ce soit dans un but esthétique, ou par crainte de lésion cancéreuse ou précancéreuse, est mise en évidence. Les problèmes soulevés par l'exérèse de nævus pour seules raisons esthétiques, sont énumérés. Les signes qui doivent éveiller l'attention sur l'évolution des nævi en lésions néoplastiques, sont passés en revue. L'auteur recommande fortement l'extirpation chirurgicale de tout nævus montrant le moindre signe d'activité ou le moindre facteur qui pourrait mener à l'activité.

M.R.D.

## THE CONTRAST ENEMA

J. W. SIMPSON, M.D., St. Boniface, Man.

THIS PAPER should properly be titled "The Barium Contrast Enema Problem"; because since its technique was first described by Fischer in 1923, it has been and continues to be a problem for radiologists, as one finds when he studies the literature of more recent years, or talks with his colleagues. The one important clinical indication is bleeding per rectum. In the absence of a definite demonstrable cause, a polyp is to be suspected and these are seldom demonstrated by the routine barium enema.

Fischer, in his original paper, pointed out that the essential disadvantage of an opaque enema lies in the use of a contrast mass which is impermeable to x-rays. For this reason, loops which are situated on top of each other cannot be distinguished. Tumours which project into intestine are frequently blotted out and are visible only under certain favourable conditions. Ulcers are not shown.

For demonstration of polyps in the rectum or sigmoid, sigmoidoscopy is the most accurate method, but even when such examination is positive, a contrast examination should be made to exclude additional polyps at a higher level. The importance of the discovery and eradication of such polyps is not only because of their hæmorrhagic tendencies, but because they are potentially malignant.

A barium contrast enema may also demonstrate an occasional polypoid carcinoma not seen in routine barium enema study. Lesions which appear to be completely obstructing to the barium enema may be more completely demonstrated with insufflated air, which will pass through the canalized portion of the lesion. It is valuable in study of other conditions, e.g., chronic-ulcerative colitis, ileo-cæcal tuberculosis and endometriosis.

Fischer stated that the following diagnostic features must be considered.

1. *Contour of wall in regard to its course.* Even if several loops are superimposed, the contours of the individual loops remain distinct and permit differentiation.

2. *Contour of wall in regard to its regularity and lineation.* Irregularities and more or less coarse spottiness indicate adherence of contrast particles to the rough surfaces of an ulcer. Abnormal lineation of the contours suggests adhesions and pericolic constrictions.

3. The lines, ellipses and circles due to the different projections of the contractions of the annular muscles. Intactness of these lines permits the exclusion of pathologic transformations at the sites concerned. Continuation of the lines from one wall contour to another demonstrates that the contours in question belong together.

4. Easy recognition of tumours, contrast crumbs adhering to rough or ulcerated mucosa, balls of faecal matter and foreign bodies. (Shadows due to such causes are referred to by later writers as fictitious polyps.)

5. Degree of expansibility of the colon.

6. The distension produced by the filling with air and the positional change of mobile portions of the colon brought about by the change in patient's position. From this one may draw conclusions regarding adhesions.

1. In our group, in common with other radiologists, we have never been happy with our results. Using a standard preparation of barium sulphate, and routine barium enema preparation, we found that a fairly high percentage of films showed features which have been described by Moreton and Yates,<sup>1</sup> as (a) drying of the barium on the colon wall, giving the appearance of paint cracking and peeling from a concrete surface; (b) non-adherence of the barium to the colon wall, with resulting lack of contrast sufficient for detail study, and (c) uneven adherence of the barium to the colon wall with spotty visualization of detail. We also found that we were making a large number of repeat examinations to exclude fictitious polyps.

2. We had been doing an ordinary complete barium enema and introducing air after evacuation. Following method suggested by Moreton and Yates, we tried injecting barium to the splenic flexure and then rotating patient into various positions until barium passed to the ascending colon. We then had patient evacuate as rapidly and completely as possible, and followed with air. However, in hospital practice, many patients are old or quite ill and evacuation would be slow and incomplete. Only the occasional examination was completely satisfactory.

3. Following a report by Jones, Kaplan and Windholz,<sup>2</sup> of the development and use of a colloidal barium, we began to use Baridol. This mixture is quite thick and would not run through the enema tube via gravity except very slowly. We put it in a hot water bottle and compressed it between two hinged boards. This worked better but was still slow. We tried to fill the colon to the splenic flexure and have the remainder of the colon filled by rotating the pa-

tient, during which time we introduced air. Results were better than by using standard barium sulphate but examination was very time consuming.

We then decided to try diluting the Baridol and have for several months been using a mixture of two parts Baridol and one of water, which is warmed slightly before use. This mixture passes well through ordinary enema nozzle by force of gravity alone. For our first attempts, we filled the colon with Baridol, took a P.A. film, had patient evacuate and took usual post-evacuation film. Then we introduced air under fluoroscopic control, and completed examination with A.P. and P.A. stereoscopic films. In some cases, this method was satisfactory, but, frequently, too much of the mixture was retained in the colon after single or repeated evacuations and air contrast examination was required to be delayed to another occasion, or was unsatisfactory if proceeded with. We find that there is a certain optimum amount of the opaque medium which should be retained in the colon. Too much or too little gives less satisfactory visualization. Recently we have again reverted to filling the colon only to the splenic flexure, and rotating patient so that some passes to caecum. No films are taken at this time. Patient evacuates, air is injected and A.P. and P.A. stereoscopic films are made. If required, an ordinary barium enema examination is made following day. We believe that our results are now better. Visualization is good, artefacts or false polypi are less often encountered, and a more definite positive or negative report can be made. We still like to repeat examination where a positive diagnosis of polyp is made.

In 1950, Yates, Moreton and Cooper in an investigation of the cause and nature of fictitious polyps concluded that they were the result of various faecal particles, oil globules, such as undigested castor oil or mineral oil, non-water soluble grease introduced on proctoscope and enema tip, and air bubbles coated with barium. They recommended, as a result of their findings, the following preparation schedule which we have recently been following and which we believe has reduced number of fictitious polyps and consequently number of repeat examinations.

1. Patient eats no supper on night previous to examination.

2. At 6.00 p.m. an ounce of castor oil. More is expelled as undigested oil.



3. Beginning at 6.00 a.m., three small soapsuds enemas at 15 minute intervals using soap on enema tip rather than grease.

4. Small breakfast—toast or coffee—at 7.00 a.m. This is omitted if caecum is particularly to be examined.

5. X-ray—at 8.00 a.m.

4. Other writers have described preparation schedules showing some variation, e.g., Jones, Kaplan and Windholz claim that one ounce of castor oil is insufficient for thorough cleansing, and that they have had no bad results, using two ounces. They use cleaning saline enemas rather than soapsuds, which they claim cause air bubble formation. Last enema is given at least two hours before examination, in order to minimize amount of retained gas and fluid. They give a light supper and no food after 10.00 p.m. We have no practical knowledge of this method of preparation nor have we used the high voltage technique in the diagnosis of polypoid growths of the colon as described by Cesare Gianturco.<sup>3</sup>

Since preparation of this paper a more recent presentation of this method has been published<sup>4</sup> together with other papers of a symposium on examination of the colon presented at meeting of Radiological Society of North America at Cincinnati, Ohio in December 1952. Gianturco and Miller state that colonic polyps were found in 2.8% of 7,000 autopsies by Lawrence, and that advent of x-ray equipment capable of 120 to 130 K.V. has made it possible to demonstrate small colonic growths by penetrating the column of barium with high voltage x-rays. Polyps appear as translucent shadows just as cholesterol stones are visualized by gall bladder dye. They stress preparation—using 2 oz. of castor oil in evening and a number of cleansing enemas in a.m. A diagnosis of colonic polyp is rendered only if the shadow is shown by two separate examinations. In 1552 routine exams they found 42 with polyps and in 28 of these no bleeding had occurred. Proctoscopy on 35 of these later showed 9 rectal polyps which led authors to do routine proctoscopy and in 365 patients examined they found 28 rectal polyps.

Perhaps this may come to be the choice of methods if one has equipment and intends to do barium contrast enema examinations routinely. It will reveal small lesions of colon and all other diagnostic features of barium enema study have been retained. In this case, we feel that the air contrast enema would still have value in cases of bleeding from the bowel or where a polyp is

suspected. Our results have been definitely improved by the method we have outlined. We are quite sure it is not the final answer to the problem and have only presented it in the hope of stimulating helpful discussion and further experimentation.

I would stress the important points: (1) Thorough preparation. (2) Sufficient air in colon. (3) Re-examination in all positive cases before final diagnosis.

#### REFERENCES

1. MORETON, R. D. AND YATES, C. W.: *Radiology*, 54: 541, 1950.
2. JONES, H. H., KAPLAN, H. S. AND WINDHOLZ, F.: *Radiology*, 56: 561, 1951.
3. GIANTURCO, C. AND MILLER, G. A.: *Radiology*, 60: 497, 1953.
4. POTTER, R. M.: *Radiology*, 60: 500, 1953.

#### RÉSUMÉ

On a recours au lavement baryté avec insufflation après exonération dans les cas d'hémorragies rectales où la cause n'étant pas évidente, pourrait être un polype. Ces lésions échappent au lavement ordinaire à cause de la densité et de l'épaisseur de la colonne de barium. L'examen sigmoidoscopique est sans doute plus précis, mais même lorsqu'il est positif, d'autres lésions situées plus haut peuvent être révélées par le lavement baryté avec insufflation. Il peut aussi servir à démontrer la présence de colite ulcéreuse chronique, tuberculose iléocoéciale, endométriose, et aussi, donner une meilleure image des lésions sténosantes non pénétrées par la bouillie barytée. La technique ordinaire du lavement produit souvent des erreurs qui nécessitent un second examen. L'exonération rapide suivie d'insufflation n'est pas toujours possible chez les grands malades ou chez les vieillards. L'emploi de la préparation colloïdale nommée "Baridol" a certains avantages quoique sa densité rende la manipulation très lente. L'auteur suggère un mélange de 2 parties de "Baridol" pour 1 partie d'eau. Les principales causes de pseudopolypes sont: des matières fécales, des globules d'huile (minérale ou végétale), des particules de graisses non miscibles et des bulles d'air. Deux méthodes de préparation du malade sont discutées. Le succès d'un examen réside en une bonne préparation du sujet, l'insufflation d'une quantité d'air suffisante et la répétition du procédé, si nécessaire.

M.R.D.

The social scientist in the medical setting has multiple opportunities, one of the most important of which is to participate with his medical colleagues in research into problems of which both are aware but which go beyond the present knowledge of either. Whenever groups of people are the object of research, the approach concepts and techniques of sociology and other social sciences are applicable and valuable. Growing interest in the ways in which social relationships modify disease patterns and concern for the measurement of the effects of medical activities upon groups of people augment the need for exploring the potential values to departments of preventive medicine of working with these fields.

Consultation with social scientists in appropriate fields may be useful, likewise, in developing programs to demonstrate comprehensive health care. For example, demographic studies can provide information insuring that representative cross-sections of the population are included in such programs. Studies of patterns of community leadership may help in the establishment of new programs.—*J. Med. Educ.*, 28: 91, 1953.

SOME OPINIONS ON  
LONGEVITY\*HAROLD N. SEGALL, M.D., F.A.C.P.,  
Montreal

THIS AFTERNOON, during the Symposium on Atherosclerosis, we shall learn of recent progress in experimental investigation of the principal anatomical peculiarity of old age. Reflecting on the significance of the contributions to our program it seemed appropriate to offer some remarks about human longevity before the symposium begins.

In 1905, when William Osler was 55 years old he was fêted at a subscription dinner in New York on the eve of his departure from Johns Hopkins to Oxford.<sup>1</sup> On this occasion his friends presented him with a book on old age, Cicero's *Cato Major, de Senectute*, translated into English by Logan and printed by Benjamin Franklin in 1744. Only a few days before, in his valedictory address Osler had declared:

"I have two fixed ideas, well known to my friends, harmless obsessions, with which I sometimes bore them, . . . . The first is the comparative uselessness of men above forty years of age: . . . in the science and art of medicine, young and comparatively young men have made every advance of the first rank, . . . . My second fixed idea is the uselessness of men above sixty years, and the incalculable benefit it would be in commercial, political, and professional life, if as a matter of course, men stopped work at this age."

These statements, lifted out of their context, evoked intense, scowling disagreement and protest from the lay press and the general public. At present the reaction would be similar and perhaps more intense. In 1905 the average duration of life, predictable at birth was about 50 and at 55 a man already felt himself classed among the old, destined to survive perhaps to three score and ten. Today the average duration of life predictable at birth is about 70 years and it is at this age that a man or woman begins to feel old and entertains the idea that he or she may survive beyond 80 or 90. Twenty years have been added to the average length of life since Osler's prime; what does this mean to each individual and what to mankind as a whole?

"Everybody wants to live long, but nobody wants to be old." In this aphorism Talleyrand<sup>2</sup> epitomized the private, personal view of long-

evity professed by most people. Darwin derived the biological law of the survival of the fittest and this law implies that the individual seeks to live as long as possible. In Psalm 39 David asks how long he is to live. After much travail man's study of man has provided an answer in terms of "the arithmetic of human welfare"<sup>3</sup>—statistics: the average duration of life predictable at birth is about 70 years. Would this have satisfied the Psalmist? The editors of the King James edition of the Bible composed the following heading for the 90th psalm: "Moses setting forth God's providence, complaineth of human fragility, divine chastisements, and brevity of life; he prayeth for the knowledge and sensible experience of God's good providence". Reference to the brevity of life appears in the familiar tenth verse of this psalm, "The days of our years are three score and ten and if by reason of strength they be four score years, yet is their strength labour and sorrow; for it is soon cut off and we fly away." Usually we hear this declaimed as a decree. It would seem that some scholars think it should be read in the mood of a lament by a malcontent.

David wrote the psalms in the later years of his life. The poet James Ball Naylor<sup>4</sup> tells of this in the following lines:

"King David and King Solomon led merry merry  
lives  
With many many lady friends and many many  
wives  
But when old age crept over them, with many  
many qualms  
King Solomon wrote the Proverbs and King David  
wrote the Psalms."

Accepting for the purpose of this discussion, that the psalmist represented Moses as complaining about the brevity of a life of 70 or 80 years, we may now ask whether this desire of the elderly David to live longer represents the wisdom or the greed of old age. Much has been spoken and written of the attributes of man in different phases of his life. In all cultures the old are praised for their wisdom. But some dissenters also make themselves heard. Some of Osler's views belong to the school of Horace,<sup>5</sup> who in *Ars Poetica* states that the ills encompassing the old man include, his desire for gain, his miserliness, his lack of energy, his greediness for longer life, his quarrelsomeness, his praise of the good old days when he was a boy, and his condemnation of the younger generation. Osler dissented from this last item, he praised youth.

\*Read at the Sixth Annual Meeting of the Canadian Heart Association, June 16, 1953, Winnipeg.  
From the Departments of Medicine of McGill University, The Montreal General Hospital and the Jewish General Hospital, Montreal.



Pope Clement III also belonged to the school of Horace, but admonished the young with the following, "Young men be not proud in the presence of a decaying old man, he was once that which you are, he is now that which you will be."<sup>5</sup>

It would be both interesting and useful to know what a modern authority would say about longevity. The ideal authority might be described as a man who himself belongs in the age group of over seventy enjoying obviously good mental vigour, and suffering only minor physical disabilities of old age. Moreover, he should be a physician who has studied not only the individual but has led in the study of public health and understands the economic and social implications of longevity. By a stroke of good fortune I have been privileged to discuss the significance of the possibility that, by the year 2000, the average duration of life may be 100 years with just such an ideal authority in the person of Professor Haven Emerson of New York. Dr. Emerson, who is now 79 years of age, thinks that research should be directed towards improving the lives of people younger than 70, for little is to be gained from costly efforts to lengthen the average duration of life much beyond 70. Permit me to quote one sentence from a letter he wrote to me recently:

"Let us apply such wisdom as we have to build, to protect, and to develop the health of body and mind while the cells of the organism are capable of repair, growth, activity; from prenatal care, through the years of maturity, (70 years if you will); but not make believe we can salvage the senescent and by good hygiene return the qualities of youth to those already in the later decades of life."

These few selected sages favour the opinion that greed, rather than wisdom inspires the old man's desire to live longer.

Protagonists of the opposite view are not lacking. In 1934, Johnson Brigham,<sup>6</sup> who had been state librarian of Iowa, a widely travelled and erudite man, compiled a book of quotations about old age when he was nearly ninety years old. In the introductory chapter, he comments on the usual, familiar intonation of the ninetieth psalm, declaring:

"I have a grudge against the psalmist. The worldly wise David should have known better than to put into writing the generalization, 'The days of our years are three score and ten.' The psalmist's generalization has done immeasurable harm to millions of men and women who accept the exaggeration as 'holy writ'. As they approach the three score and ten they weakly conclude that with them, 'the jig's up' and that nothing remains for them, but to prepare for the end."

Brigham belongs to the school of Cicero whose essay on old age in any of the translations that are available including that of Logan which was given to Osler, seems as fresh as though it had been written this week and came off the press this morning. With much self-control I have limited myself to but one quotation from this essay, which supports Brigham's view.

"There is the tranquil and serene old age of a life spent quietly amid pure and refining pursuits, such an old age, for example, as Plato, who died, pen in hand, in his eighty-first year, such as that of Isocrates who was ninety-four when he composed *Panatheniacus*. His teacher Gorgias rounded out one hundred and seven years and never rested from his pursuits."<sup>7</sup>

A physician since 1920, whose education is still in progress, now aged 55, I would like to join the schools of David and of Cicero, with a pattern of thought which belongs to modern times. The period of internal gestation remains fixed at nine months, but the period of external gestation has been lengthened progressively both by social pressure and by legislation. No longer do children in our part of the world become factory workers at 8 or 10; on the contrary, they are compelled to remain at school until about 14 or 16. Moreover, the technology involved in modern living and in adequate military defence demands large numbers of men and women who have enjoyed the privileges of higher education. This lengthens the period of external gestation into the twenties. Stephen Leacock, commenting on modern medical education, said that by the time the doctor is ready to hang up his shingle, he is old enough to be a grandfather. This longer period of external gestation merits a long life in which to exercise the fruits of education and for this, I think, no healthy life can be too long.

Science has lengthened the average span of life through public health measures by preventing premature death of the very young and the young. Its present task is to extend to the majority of old people the good physical and mental health which comes naturally to relatively few in the seventh to the tenth decades of life. The achievements of science in the past five or six decades justifies the view that in a similar space of time, in the immediate future, the medical, the economic and the social problems of the people who live beyond seventy will be solved to a large degree. If the men and women who are now devoting themselves to discover methods of controlling and preventing atherosclerosis and

other disabling affections of old age make it possible for a coming generation to live to 100 as the present generation lives to 70, so much the better. Our present social organization is inadequately prepared to make the later years of a life of 70 or 80 as satisfactory as they might be for the individual and his community. Among other things, we must learn to do what Osler actually did and not what he facetiously preached. At 55 Osler changed his job from a more to a less arduous one; then he continued to work as usual at his vocation and his avocations until his terminal illness at the age of 70. He had pneumonia and interlobar empyema. Modern medicine and surgery usually prevent such premature death at 70. The Oslers of today and of tomorrow will live on and on after 70. My optimism, a common congenital attribute, causes me to think that during old age, not greed but

wisdom and goodness will prevail. If the majority of the older people should be afforded the vigour exemplified by Plato and Isocrates in ancient times, by Toscanini, Churchill and Einstein in these times, then the wise elders of the population will be both numerous and vigorous and may succeed in leading mankind to realize its hopes for peace and good will. The earth will provide good living conditions for all mankind living in peace.

## REFERENCES

1. CUSHING, H.: *The Life of Sir William Osler*, The Clarendon Press, Oxford, Vol. I, p. 666, 1925.
2. LAWTON, G.: *New Goals for Old Age*, Columbia University Press, New York, p. 74, 1943.
3. HOGGEN, L.: *Mathematics for the Million*, George Allen and Unwin, London, p. 571, 1936.
4. PERRY, R. B.: *Plea for an Old Age Movement*, Vanguard Press, New York, 1942.
5. COFFMAN, G. R.: *Old Age from Horace to Chaucer*, Speculum, p. 249, 1934.
6. BRIGHAM, J.: *The Youth of Old Age*, Marshall Jones Company, Boston, p. 71, 1934.
7. *The Basic Works of Cicero*, The Modern Library, New York, p. 132.

### THE DISADVANTAGES OF URETEROSIGMOIDOSTOMY\*

C. D. CREEVY, M.D., Minneapolis, Minn.

WHILE MUCH has been written about diversion of the urine into the bowel for a variety of defects and diseases of the bladder, relatively little has been said about the late complications and end results of this procedure, and its effect upon longevity. Most papers upon the subject have dealt with technique; as anyone who has read the monumental review of Hinman and Weyrauch (1937) knows, innumerable variations have been advocated; many more have been reported since their paper.

There is no doubt that ureterosigmoidostomy is, on occasion, compatible with long survival. Thus Stevenson in 1941 discovered a patient who was still alive 43 years after ureteral transplantation for exstrophy of the bladder. He collected reports of 11 others surviving 20 to 30 years. Lower found that six of his patients had lived or were living more than 20 years after operation. Jacobs, discussing his personal experience with 138 ureterosigmoidostomies, mentions six patients who lived ten years or more. Hinman, Jr. has recently collected reports of the birth of

33 babies to 26 women with ureterosigmoidostomy, and has added two of his own.

Furthermore, the widespread application of transfusion and the effective use of antibiotics have greatly reduced surgical mortality. However, G. G. Smith has well said, "but until the late results of ureteroenterostomy show a much lower incidence of renal failures, one hesitates to employ the method for a condition which is not in itself dangerous to life". Hinman said that it was only an occasional brilliant result that encouraged him to persist in his efforts to perfect the operation.

The reasons for these views are not at all obscure. The basic principle of the operation (the connection of the normally sterile upper urinary tract to the normally infected colon) is unphysiological, and will remain so unless or until someone discovers a universal, non-toxic antibiotic to which bacterial resistance never develops.

The problem is not, however, one of infection alone, since several well-known factors operate to initiate and to aggravate the effects of bacterial invasion. First, the ureters must be mobilized for at least a short distance to permit their entrance into the bowel. This necessarily damages their extrinsic blood supply. While the intrinsic vessels ordinarily suffice to prevent necrosis, the impaired vascularity may lead to

\*From the Urological Division of the Department of Surgery of the Medical School, University of Minnesota, Minneapolis.



temporary cedema which starts the almost inevitable dilatation of the upper tract. The same process may reduce ureteral resistance to infection, and result in late stricture at the cut end of the ureter. This danger is presumably lessened but not entirely eliminated by slitting one side of the end of the ureter and anastomosing it directly to the bowel (Nesbit) so that there is no free, partly devascularized end protruding into the colon.

A second danger inherent in all methods except Nesbit's and possibly Cordonnier's, is that of compression, at first by inflammatory cedema and later by scarring, of the ureter as it passes through the wall of the colon. This hazard is doubtless reduced by preoperative preparation of the bowel with oral antibiotics, and by their parenteral use during convalescence. Baker has presented some experimental evidence suggesting that the postoperative administration of cortisone will minimize fibrosis in the incision in the colon, but this needs both experimental and clinical confirmation; its potential usefulness is great.

A third danger is that of reflux of intestinal contents into the ureter. This is fostered by Nesbit's method of anastomosis, and probably by Cordonnier's, since both depend upon ureteral peristalsis to prevent regurgitation. Whisenand and Moore have reported a case in which Nesbit's operation was performed in a patient with bilateral nephrostomies. Gas and faeces escaped from the renal catheters until they were removed, after which recovery occurred! Several observers (Parks, Mathis, Turner and Saint) have seen gas in the kidneys and ureters in roentgenograms made after such operations. Woodruff, Cooper and Leadbetter, Riba, and Weyrauch and Young have all presented evidence from animal experiments tending to show that the use of the submuscular tunnel of Coffey greatly lessens the danger of reflux. The prevention of regurgitation was Maydl's object in anastomosing the whole vesical trigone to the sigmoid, but Baker and Miller have shown, in the dog at least, that the intracolonic pressure finally overcomes even the normal ureterovesical valve when the defunctionalized colon is anastomosed to the bladder.

Mathisen has recently presented an interesting variant of ureterosigmoidostomy intended to prevent the entrance of faeces into the ureters. He wraps the ureter in a quadrangular flap of

intestinal wall which is then made to protrude into the lumen of the sigmoid. The objects of this operation are to support the protruding ureter, and to permit its compression both by colonic peristalsis and by intestinal contents and pressure. He was "unable to demonstrate reflux" in 18 clinical cases after this operation, but his longest follow-up was one year. This method deserves a thorough trial and investigation.

The route of infection of the kidneys after ureterosigmoidostomy is no mystery. In addition to the lumen of the ureter, organisms must be able to follow the periureteral lymphatics to the kidneys, since Hinman, Sr. has shown that the dog's kidney may become infected when the unopened ureter is buried in a trough in the wall of the colon.

It is easy to show statistically the frequency and seriousness of obstruction and infection after ureterointestinal anastomosis. Harvard and Thompson blamed pyelonephritis for 50% of the surgical and 67.5% of the late deaths in their series of 98 cases followed for between five and 35 years after ureterosigmoidostomy for exstrophy. Smith investigated 54 survivors of ureterosigmoidostomy. Nine died of "renal failure" within two years; four more required cutaneous ureterostomy for infected hydronephrosis, and three others had poor renal function at the time of his investigation. Thus 16 of 54 patients (29.6%) had severe renal damage within a few years. 21 of Cordonnier and Lage's 54 patients (38.9%) showed evidence of pyelonephritis within thirty months of operation. Lapidès had never seen at autopsy a kidney which had been connected to the bowel and remained free of infection either in dog or in man.

In 258 patients subjected to urography six months or more after operation (53 from the University Hospital and 205 from the literature) only 31% had normal appearing kidneys. Since most of the urograms were made within a year of operation, the long term outlook is gloomy indeed.

The dangers of hydronephrosis and pyelonephritis after ureterocolic anastomosis are not limited to uræmia and sepsis, but involve the complication of hyperchloræmic acidosis. While Jewett and later Ferris and Odel have amply demonstrated that this results from absorption of urinary constituents from the colon, Lapidès has proved, by ingenious clinical experiments, that reduced renal function is an important

factor in aggravating the condition because it impairs the ability of the renal tubules to excrete the absorbed chlorides and other acid radicles. This was foreshadowed by Ferris and Odel's observation that unilateral nephrostomy could relieve hyperchloræmic acidosis even though the other kidney continued to secrete its urine into the colon. Our own studies have shown that hyperchloræmic acidosis occurs three times as often and causes symptoms ten times as frequently when the kidneys are damaged as when they are normal.

All this does not mean that ureterosigmoidostomy should be abandoned, but rather that it should be used only when there is no acceptable alternative, and that efforts to protect the kidneys from damage afterward should be continued. What measures do we have at our disposal now, pending the development of a universal, non-toxic, totipotent, never-failing antibiotic to which bacterial resistance cannot develop?

#### POSSIBLE SOLUTIONS TO THE PROBLEM

If diversion of the urine is required in the presence of bilateral hydronephrosis or of nitrogen retention, cutaneous ureterostomy with all its disadvantages, is preferable to ureterosigmoidostomy because of the dangers of hyperchloræmic acidosis with the latter. In good risks one may consider Bricker's anastomosis of the ureters to a short, isolated loop of ileum with an external stoma to which a Rutzen or similar bag can be fitted.

When the ureters are to be anastomosed to the colon, the latter should be prepared with care. Initial catharsis is followed by the "preoperative colon diet" of Bagen. Neomycin and polymyxin B (aerosporin) are given orally for three days before operation, and colon flushes are used on the last evening. This regimen will often yield a sterile culture from fæces secured at operation. It stands to reason that this should favour smooth healing of the anastomosis.

Certainly the anastomosis should be of the terminolateral type favoured by Nesbit in order to increase the circumference of the stoma, to leave no bare, devascularized ureter protruding into the bowel, and thus to discourage stricture formation. It may well be that this should be supplemented by the construction of a periureteral tunnel composed of intestinal muscle and mucosa in order to minimize reflux.

Mathisen's operation should be given a thorough trial in this connection. It is easily combined with terminolateral anastomosis.

Healing of the anastomosis should be promoted by the use of potent antibiotics parenterally during convalescence, and Baker's suggestion that cortisone be used should be investigated more extensively in the dog, although the literature concerning the effect of cortisone upon the healing of wounds casts doubt on the validity of Baker's assumption.

It seems perfectly obvious to me that the value of terminal colostomy with closure of the proximal end of the distal loop should be given a thorough trial because, with modern antibiotics, the colon which receives the urine can certainly be made and kept clean enough to offer considerable protection to the kidneys which, when one considers the facts, certainly need every possible help. While this measure was suggested by Krönig in 1907 and even earlier by Mauclair, it has never had a fair trial for obvious reasons. Vest has recently reported securing sterile urine from the bowel nine months after a vesicosigmoidostomy of his own devising for exstrophy, a fact which should certainly encourage studies in this direction.

#### SUMMARY AND CONCLUSIONS

1. Ureteroenterostomy subjects the kidneys to great risk of serious damage from obstruction (stricture and reflux) and infection (reflux and ascent of periureteral lymphatics).

2. When serious renal damage follows this operation, hyperchloræmic acidosis becomes a problem.

3. Cutaneous ureterostomy is preferred when renal damage antedates operation.

4. Ureteral anastomosis to the bowel should be used only when the underlying disorder threatens life or makes it intolerable, and no satisfactory alternative is available.

5. Means at hand to minimize postoperative renal damage, at least theoretically, include: Careful preparation of the bowel; the use of an operation designed to prevent stenosis of the anastomosis as well as reflux; the administration of antibiotics and possibly of cortisone during healings; and the complete diversion of the fæcal stream above the anastomosis.

#### REFERENCES

1. BAKER, R., GOVAN, D. AND HUFFER, J.: *Surg., Gynec. & Obst.*, 95: 446, 1952.
2. BAKER, R. AND MILLER, G. H., JR.: *J. Urol.*, 67: 638, 1952.



3. BARGEN, J. A.: *J. A. M. A.*, 97: 151, 1931.
4. BRICKER, E. M.: *Surgery*, 32: 372, 1952.
5. CORDONNIER, J. J.: *J. Urol.*, 63: 276, 1950.
6. CORDONNIER, J. J. AND LAGE, W. J.: *J. Urol.*, 66: 565, 1951.
7. CREEVY, C. D. AND REISER, M. P.: *Surg., Gynec. & Obst.*, 95: 589, 1952.
8. FERRIS, D. O. AND ODEL, H. M.: *J. A. M. A.*, 142: 634, 1950.
9. HINMAN, F. JR.: *Am. J. Obst. & Gynec.*, 62: 192, 1951.
10. HINMAN, F. SR.: 7th Congress Int. Soc. Urol., p. 464.
11. HINMAN, F. AND WEYRAUCH, H. M.: *Tr. Am. Ass. G. U. Surg.*, 29: 13, 1936.
12. JEWETT, H. J.: *J. Urol.*, 44: 223, 1940.
13. JACOBS, A.: *Proc. Roy. Soc. Med.*, 45: 33, 1952.
14. KROENIG: *Zentralbl. f. Gynäk.*, 31: 559, 1907.
15. LAPIDES, J.: *Surg., Gynec. & Obst.*, 93: 691, 1951.
16. LOWER, W. E.: *J. Urol.*, 50: 581, 1943.
17. MATHIS, R. I.: *Rev. Argent. de urol.*, 16: 229, 1947.

18. MATHISEN, W.: *Surg., Gynec. & Obst.*, 96: 255, 1953.
19. MAUCLAIRE: Congrès français de chir., pp. 546. Cited by Papin, 1925.
20. MAYDL, K.: *Wien. med. Wochenschr.*, 49: 250, 1899.
21. NESBIT, R. M.: *Ann. Surg.*, 130: 796, 1949.
22. PARKS, R. E.: *Am. J. Roentgenol.*, 66: 222, 1951.
23. RIBA, L. W.: *J. Urol.*, 67: 284, 1952.
24. SMITH, G. G.: *Surg., Gynec. & Obst.*, 85: 221, 1947.
25. STEVENS, A. R.: *J. Urol.*, 45: 57, 1941.
26. TURNER, G. G. AND SAINT, J. H.: *Brit. J. Surg.*, 25: 580, 1936.
27. VEST, S. A. AND BOYCE, W. H.: *J. Urol.*, 67: 503, 1952.
28. WEYRAUCH, H. M. AND YOUNG, B. W.: *J. Urol.*, 67: 880, 1952.
29. WHISENAND, J. M. AND MOORE, V.: *J. Urol.*, 65: 564, 1951.
30. WOODRUFF, W. M., COOPER, J. F. AND LEADBETTER, W. F.: *J. Urol.*, 67: 873, 1952.

## A REVIEW OF TICK PARALYSIS\*

IAN ROSE, M.B., B.S.(Lond.), Kamloops, B.C.

SIMPLICITY of treatment and assurance of cure are characteristic features of tick paralysis. Yet last year, in attempting to estimate the extent of this condition in North America a mortality of 11.7% was found among the recorded cases in the Pacific North West.

This high mortality in so curable a disease is due, in part, to lack of awareness by the medical profession of the condition. As a result it was decided to publish this article briefly reviewing the clinical picture and stressing some aspects I feel have not been fully appreciated previously.

By using all the cases on record at the Dominion Medical and Veterinary Entomology Laboratory at Kamloops, B.C. as having occurred in British Columbia and the North-Western United States the following figures have been obtained:

TABLE I.

Known cases of tick paralysis in British Columbia.....	238
Known deaths from tick paralysis in British Columbia.....	27 or 11.3%
Known cases of tick paralysis in the U.S.A.....	94
Known deaths from tick paralysis in the U.S.A.....	12 or 12.7%
Known cases of tick paralysis in the Pacific North-West.....	332
Known deaths from tick paralysis in the Pacific North-West.....	39 or 11.7%

The cases of tick paralysis ending in death fall into three groups: (1) Those that were not seen by a doctor owing to their geographical position or other cause; (2) Those that were not seen by a doctor until the terminal phase of

bulbar paralysis was already present; (3) Those under medical care but in whom a correct diagnosis was not made. This last group is probably the largest. The diagnosis has frequently been made at autopsy, while there are two cases on record in which the tick was found by the undertaker.

The main factor in making a diagnosis of tick paralysis is that its possibility should be in the physician's mind during any case of ascending flaccid paralysis occurring between the months of February and August. Once the tick has been found it only has to be removed for complete recovery to ensue in a few hours.

In the Pacific North-West the species of tick almost invariably responsible is *Dermacentor andersoni* (Stiles). Despite the wider distribution of the tick, paralysis is common only west of the Rocky Mountains. It is seen in British Columbia, Alberta, Washington, Oregon, Idaho, Montana, Wyoming and Colorado.<sup>1</sup>

The tick is active between the months of February and August, being at its greatest during the months of April, May and June.

The paralysis can affect all age groups, though it is commonest in infants and children. Girls are affected somewhat more frequently than boys. Of cases occurring in children up to the age of ten, 64% were girls.

The adult tick waits on grass and low shrubs for passing animals. When brushed on to the victim it rapidly climbs up the body, giving the erroneous belief that it has dropped out of trees from above. The tick, in climbing up from the legs, may attach to any part of the body. The scalp or neck is the commonest site, but in B.C. records, 37.34% had attached to a site other than the head or neck. In searching for a tick the whole body must be inspected, particularly the

\*Irving Clinic, Kamloops, B.C.

head, neck, axillæ, the groins and beneath the breasts.

The tick, having attached, begins to feed. It takes some seven to ten days to become fully engorged, at which time it will drop off. Usually there is a latent period of some five days between the attachment of the tick and the onset of paralysis. This fact is important, inasmuch as in this age of air travel the patient may have journeyed far from the region where tick paralysis is endemic. It therefore behoves all physicians, even those as far east as Montreal and New York, to bear this condition in mind.

Before the onset of the actual paralysis there may be a period of vague complaints, irritability, tiredness, pain or paræsthesia in the lower extremities for some twelve to twenty-four hours before the onset of paralysis.<sup>2</sup> Frequently this phase is not seen but the patient begins to stagger and his movements lose co-ordination. A few hours later flaccid paralysis is evident in the lower extremities. If the tick is not removed the paralysis spreads to the upper limbs in another twelve to twenty-four hours. Following this bulbar paralysis develops with dysarthria, dysphagia, lingual, facial and ocular paralysis. Finally respiratory paralysis and death occur.

The paralysis is of the flaccid type with loss of tendon jerks and superficial reflexes. It progresses from below upwards and is usually bilaterally symmetrical. Sensory changes are characteristically absent, though paræsthesiæ have been described.

The same upward progression is seen when the cranial nerves are involved. The sterno-

mastoid, trapezius, tongue and pharyngeal muscles become involved first, the face and extra-ocular muscles follow and finally respiratory paralysis and death. Characteristically, before the onset of bulbar paralysis, there are no changes in the temperature, pulse, respirations, leukocyte and differential blood counts, urine or cerebrospinal fluid.

Finally, the tick will be found feeding somewhere on the body.

The treatment is simply to remove the tick. However, it should be remembered that the patient may have acquired more than one tick and a thorough search should be made, since it is easy to feel satisfied and give up as soon as one has been found. Many different and complicated techniques have been described for removing the tick. These have been invented for fear of leaving the "head" of the tick behind. This does not occur with *Dermacentor andersoni* and the tick should simply be pulled out by the body. Once this has been done recovery will ensue, usually in twelve to forty-eight hours, or occasionally longer.

I am most grateful for the help and assistance I have been given in preparing this article by Mr. J. D. Gregson and other personnel of the Dominion Medical and Veterinary Entomology Laboratory at Kamloops.

We would like to have details of any cases of tick paralysis so far unreported and particularly living ticks that have produced paralysis.

#### REFERENCES

1. JELLISON, W. L. AND GREGSON, J. D.: *Rocky Mountain M. J.*, January, 1950.
2. ABBOTT, K. H.: *Proc. Staff Meet., Mayo Clin.*, 18: 39, 59, 1943.

### THE OXYGEN RESATURATION CURVE—A MEASURE OF CARDIO-PULMONARY FUNCTION\*

LLOYD A. CASWELL, M.D.,  
IAN MILNE, M.D. and  
R. H. TAPLIN,† Montreal

THE NEED for a simple and reliable method of evaluating cardio-respiratory function is widely recognized. Many attempts have been made to

adapt oximetry to this purpose.<sup>1, 2, 3</sup> Due to the limitations of the Millikan and similar oximeters, these attempts have been largely unsuccessful. It seemed likely that a high speed recording, direct reading electronic oximeter would obviate these difficulties. Consequently an electronic oximeter was used to study the value of oxygen resaturation curves as a measure of cardio-pulmonary function.

More than 300 oxygen resaturation curves done on 55 subjects have been studied. These cases consisted of eight normals and a variety of patients with impaired cardiac or respiratory function.

\*This work was carried out in the McGill University Clinic and the Cardio-Respiratory Department of The Montreal General Hospital. It has been supplemented by a research grant from McGill University and with the co-operation and assistance of the Canadian Marconi Company.

†Research Department, Canadian Marconi Company.



## METHODS

The determination of oxygen saturation of haemoglobin by electronic oximetry has received some attention during the past few years.<sup>4 to 7</sup> A new type of ear-piece has been described by one of us.<sup>6</sup> When this is used with an electronic oximeter, arterial oxygen saturation changes can be recorded directly with a sensitivity not previously possible.<sup>6, 7</sup>

The earpiece consists of a light source which after passing through the ear is scrambled and filtered into an aggregate of photo-voltaic cells. One set of filters transmits wavelengths longer than  $640 \mu$  and is responsive to ear tissue, the amount of blood in the light path and changes in oxyhaemoglobin. This is called the red channel. The other filters transmit wavelengths longer than  $800 \mu$  and are responsive to ear tissue and the amount of blood but not to changes in oxyhaemoglobin. The output of the earpiece is fed to the oximeter, which compensates for variable ear tissue thickness and the red channel is corrected by the infra-red channel for the amount of blood present in the light path. The precisely corrected red channel therefore reads the percentage of oxygen saturation of haemoglobin after the variables due to ear thickness and blood flow have been eliminated. The whole instrument is engineered to give stable and reliable readings over an extended period. The results are permanently displayed in the form of a graph using a direct writing recorder, (Fig. 1).

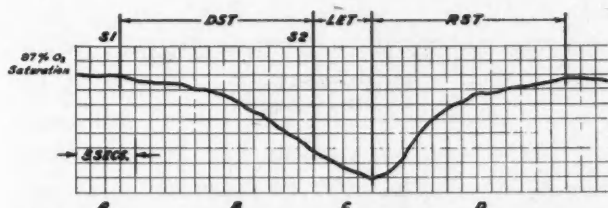


Fig. 1.—The complete curve. Patient is switched from room air to mixture at  $S_1$  and haemoglobin desaturates until switched back to room air at  $S_2$ . After the lung to ear circulation time (L.E.T.) saturation starts climbing to normal.

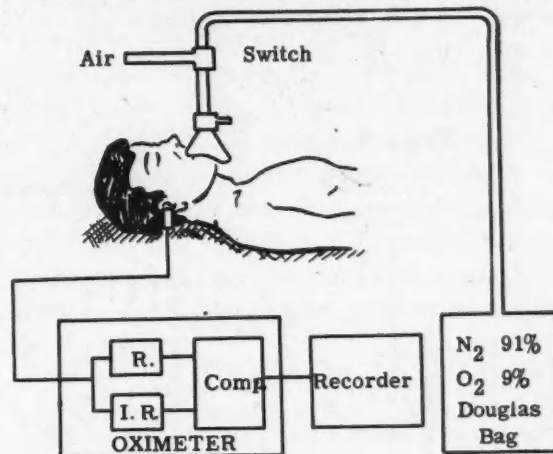
## RESATURATION TECHNIQUE

The patient is kept recumbent for twenty minutes to ensure a "resting" state. The oximeter is set to read the ambient saturation. The patient is then switched to a Douglas bag containing 91% nitrogen and 9% oxygen (Fig. 2). When the degree of desaturation is approximately 85%, the patient is switched back to room air. This change must be made at the end of expiration. After an interval which represents the lung to ear circulation time, the oxygen saturation climbs back to the original value (Fig. 1). It is difficult to be certain that patients are relaxed despite twenty to thirty minutes rest in recumbency prior to performing the test. Consequently we record the oxygen resaturation time when the patient breathes with maximum effort as well as during the resting state (Fig. 3).

We have found that blood volume in the ear remains quite constant at rest. Consequently, it is possible to make recordings without continuous correction for blood volume. However, in cases with a prolonged resaturation time it is an ad-

vantage to provide continuous correction for blood thickness.

The degree of desaturation below 90% need not be precise. Below this level resaturation curves are steep and are essentially superim-



## ELECTRONIC OXIMETER

Fig. 2.—Layout of apparatus. The subject inhales the gas mixture until saturation falls below 90% and then is switched to room air and the oximeter then records the rate of resaturation to normal.

posed. When the patient is switched to room air there is a delay before the saturation curve starts climbing back to normal. This delay represents the time for the room air to enter the lungs,

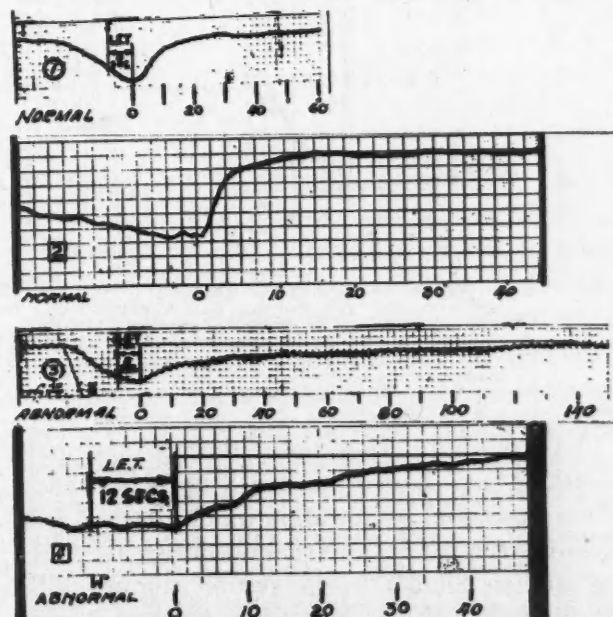


Fig. 3.—Four recordings of oxygen resaturation curves are shown: (1) is from a normal individual at rest; (2) is from the same case while breathing maximally; (3) is a resting oxygen resaturation curve in a patient with diffuse pulmonary emphysema; (4) is an abnormal resaturation curve while breathing with maximum effort.

diffuse into the pulmonary vessels and travel via the heart to the ear. We prefer to call this the L.E.T. (lung ear time) rather than the circulation time.

## RESULTS

*Oxygen resaturation time.*—The oxygen resaturation times at rest in the normals varied between 15 and 35 seconds (Fig. 4). Patients with known respiratory disability had strikingly prolonged oxygen resaturation times (50 to 640 seconds) (Fig. 4).

L.E.Ts. were greatly prolonged in cases with congestive failure and this was associated with moderate lengthening of the oxygen resaturation time. In patients with impaired air distribution, the L.E.Ts. were only moderately prolonged but the oxygen resaturation times were markedly prolonged.

Fig. 4

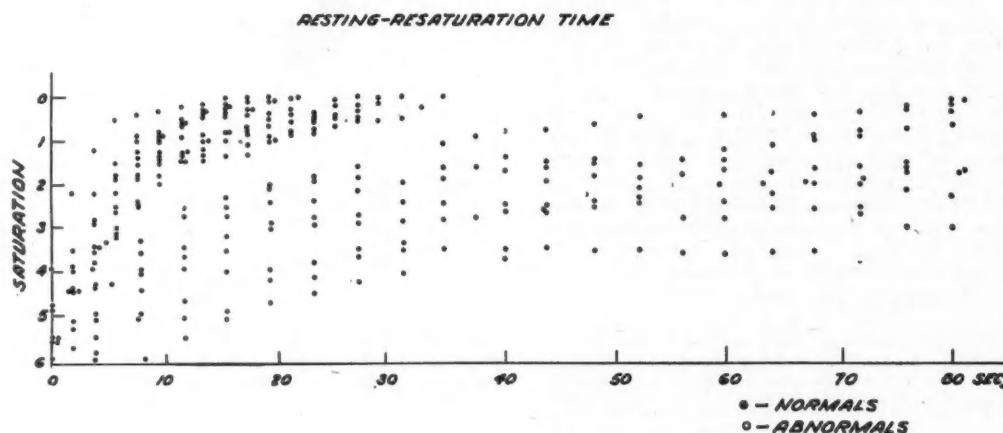


Fig. 5

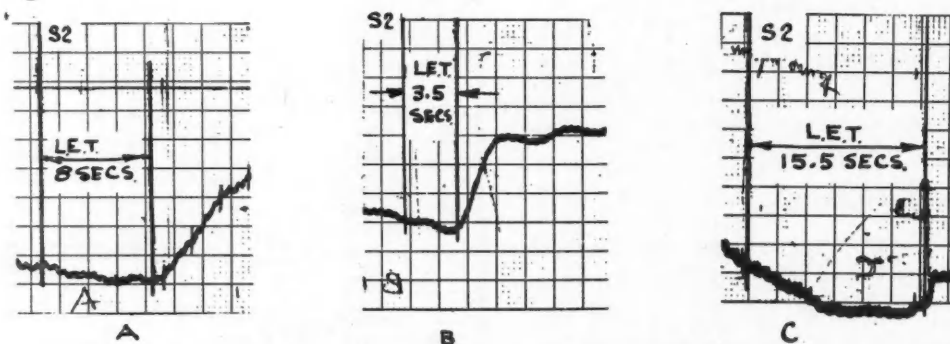


Fig. 4.—The oxygen resaturation curves on eight normals and eight abnormal with minimal to advanced respiratory disability are plotted. The resaturation time in the worst case extended 640 seconds. The normal and abnormal can be clearly differentiated. Figure 6 on the Y axis approximates 85% arterial oxygen saturation, 0 is the ambient arterial oxygen saturation.

Fig. 5.—Three recordings showing the L.E.T. are presented: (A) is from a normal subject; (B) shows a short L.E.T. in a case of hyperthyroidism; (C) is the L.E.T. in a convalescent case of congestive heart failure.

Oxygen resaturation times during maximum breathing are shorter (normal 8 to 12 seconds). These maximum resaturation times are useful in assessing the patient's relaxation during the resting studies. Similar to the resting studies, with maximum breathing, even minor respiratory disability is demonstrated by a marked prolongation of the oxygen resaturation time.

*Lung ear time (L.E.T.)*—Fig. 5 shows three typical L.E.Ts. In our normals, the mean L.E.T. was 7.2 seconds with a range of 5 to 8 seconds. In a single case with hyperthyroidism a markedly shortened L.E.T. was found (3.5 sec.). The

## DISCUSSION

We have not calibrated the electronic oximeter in absolute terms. For the purpose of this study absolute values of oxygen saturation do not seem to be essential. The high speed direct recording oximeter and the new earpiece were found to be satisfactory for this work.

The L.E.T. is an important component of the resaturation curve. It appears to differentiate cardiac and respiratory factors producing prolonged resaturation curves. Resaturation curves are influenced by circulatory, ventilatory and distribution capacities. Consequently, the shape



of the resaturation curve does not delineate the exact disturbance in respiratory function. Nonetheless, we have already found the oxygen resaturation time useful in diagnosis and monitoring therapy. It may also prove valuable in industrial, insurance and military medicine.

Our aim has been to devise a simple screening test which will demonstrate abnormality in respiratory function not detected by the accepted screening methods. To achieve this, further studies must be made in normal subjects. The number of normal individuals we have studied is small and hence our defined limits of normal must not be considered final. If these limits do not have to be extended to the point where there is a considerable overlap between clinically normal and abnormal subjects, then this procedure will be a sensitive index of pulmonary function.

We consider that our studies should be extended in several ways:

1. It would be desirable to have absolute arterial oxygen readings to ensure that the range of desaturation and resaturation is kept quite constant. For instance, the curves from a normal individual who is desaturated and resaturated over the range 85 to 97% might not be comparable to the curves from a patient whose range is 75 to 87%.

2. When recordings are made using only the red channel, blood volume changes in the ear affect the reproducibility of the resaturation curve. By observing, but not recording these ear volume changes, we believe them to be slight. The electronic oximeter now provides continuous compensation for blood thickness changes.

3. The rate and depth of respiration, even at "resting" levels, varies a great deal. We have observed that varying minute ventilation has a considerable effect on the configuration of the resaturation curve. Controlled respiration would be desirable, but this is not practical. Further work is necessary to determine the effects of changes in minute ventilation on the resaturation curves.

The authors desire to express their thanks to Mrs. M. McLaughlin, B.Sc., for technical assistance in this work.

#### REFERENCES

1. GULLICKSON, G., ELAM, J. O., HAMMOND, M., PAINE, J. AND VARCO, R. L.: *Am. Heart J.*, 35: 940, 1948.
2. CALLEBAUT, C.: *Arch. de Mal du Coeur*, 42: 723, 1949.
3. FOWLER, W. S. AND COMBE, J. H. JR.: *J. Clin. Investigation*, 27: 327, 1948.
4. GOLDIE, E. A. G.: *J. Scient. Instruments*, 19: 23, 1942.
5. TAPLIN, R. H.: *J. Aviat. Med.*, 24: 70, 1953.
6. *Idem*: Professional Group on Medical Electronics, IRE Convention, March, 1952.
7. PAUL, W. H.: *J. Scient. Instruments*, 24: 165, 1953.

### AN EVALUATION OF THE NEEDLE BIOPSY IN THE DIAGNOSIS OF PROSTATIC CARCINOMA\*

WILLIAM B. SPRING, M.D.,†  
Toronto  
MANNING W. ALDEN, M.D.,‡  
Silver Spring, Maryland

RECTAL PALPATION is the chief link in the diagnostic chain for the clinical detection of prostatic cancer. A carcinomatous change is suspected when induration replaces the normal elastic consistency of the gland. While induration is the *sine qua non* of the physical changes in the prostate in carcinoma, it is not pathognomonic

of the condition. Stones, tuberculosis, chronic non-specific infections, healed infarcts, and occasionally benign hyperplasia produce induration of varying degrees, making histological confirmation of suspected lesions imperative.

Approximately 10% of prostatic carcinomas do not impart the sensation of induration to the palpating finger and therefore cannot be diagnosed by rectal examination alone. These cases include carcinoma which is soft rather than hard, and small carcinomas buried deep in the lateral lobes or in the median lobe. Ferguson<sup>1</sup> summarized the findings of several investigators, and reported that 183 of 1,426 prostates (12.8%) removed for benign hyperplasia showed early or borderline cancers. In all of the 183 cases the carcinoma was unsuspected during life and the malignancy was found in either the lateral or median lobes, not one reported as being in the posterior lobe.

\*From the Departments of Urology and Pathology, Gallinger Municipal Hospital, Washington, D.C.  
†Attending Urologist, The New Mount Sinai Hospital, Toronto, Ontario. Formerly Resident in Urology, Gallinger Municipal Hospital, Washington, D.C.  
‡Director of Laboratories, Gallinger Municipal Hospital, Washington, D.C.

To help reduce the potential inaccuracy of the rectal examination several diagnostic aids have been investigated. The serum acid phosphatase determination is widely used as a test for carcinoma of the prostate. This test, however, is not pathognomonic for carcinoma and is positive in only about 15% of cases in which the malignancy is still confined to the gland. An elevated serum acid phosphatase suggests spread of the malignancy beyond the prostatic capsule and is of little use as a diagnostic aid for its early detection. In recent years the cytological examination of smears of prostatic secretion has been investigated as a means of detecting unsuspected carcinoma and for establishing diagnosis in early and late malignancies in the gland.<sup>2, 3, 4</sup> The results have shown that late malignancies may be diagnosed by this method, but the procedure is of little use for early or occult carcinomas. Furthermore the danger of false positive reports has limited its acceptance as a definite diagnostic test.

Although needle biopsy of the prostate has been referred to as a useful diagnostic aid by many urologists, only three reports dealing with statistical analysis of the procedure were found. Ferguson,<sup>5</sup> Pierson and Nickerson,<sup>6</sup> and most recently Rinker and Shuman,<sup>7</sup> have reported on the value of the needle biopsy in the management of carcinoma of the prostate. It was felt that the paucity of reports dealing with the procedure warranted the publication of another, although similar study.

#### OUTLINE OF THE STUDY

The plan proposed was to incorporate a needle biopsy of the prostate as part of the urological investigation in approximately 100 patients over 50 years of age who were being studied for prostatic disease. An answer to the following questions was sought: (1) Would the needle biopsy provide tissue satisfactory for diagnosis? (2) Would carcinoma unsuspected on rectal examination be discovered by the biopsy? (3) Could an early carcinoma be biopsied with accuracy? (4) Of what value would the biopsy be in cases of late carcinoma?

*Technique.*—The biopsy was done either at the time of cystoscopy or as an independent procedure on the ward. Local anaesthesia was used but advantage was taken of a general or spinal anaesthetic if these were to be given for some other diagnostic procedure. The patient is placed

in the lithotomy position, the scrotum is elevated and anchored by means of a towel, and the perineum is painted with a suitable skin antiseptic. The Silverman biopsy needle was used exclusively in this study. A finger in the rectum serves as a guide for the introduction of both the local anaesthetic and the biopsy needle. The tip of the finger rests against the area to be biopsied, and the sheath of the instrument can be felt skirting the rectum and entering the lesion. Tissue obtained is fixed in 10% formalin and stained for H. and E. sections. A satisfactory biopsy would provide two or three slivers of tissue, each piece averaging 1.5 cm. x 2 mm.

*Results.*—The cases were divided into the following four groups, the basis for the differentiation being the degree and extent of the induration noted: Group I; No evidence of carcinoma. Group II; Isolated, indurated areas of questionable etiology. Group III; Early carcinoma of the prostate. Group IV; Diffuse induration suggesting late carcinoma.

Young's plan for grading induration detected on rectal palpation of the prostate was adopted.<sup>8</sup> Thus Group I would correspond to grades 0 and 1, Group II to grades 2 and 3, and Groups III and IV to grades 3 and 4. The extent of the induration differentiates Groups III and IV, an early carcinoma being defined as an area of induration no greater than 2 to 3 cm. in diameter in a gland which had not lost its mobility from carcinomatous extension into the periprostatic tissues. Aside from the failure to detect occult carcinoma by rectal palpation (Group I), the cases belonging to Group II provided most of the difficulties with diagnosis. In this group were included lesions which were usually smaller than 3 cm. in diameter, and of a consistency ranging from that occurring with chronic prostatitis (grade 2) to that seen with carcinoma (grade 3).

The tissue obtained by biopsy was classified pathologically as follows:

1. Tissue inadequate for diagnosis. This diagnosis was given when the biopsy failed to include prostatic tissue, the needle having entered the periprostatic tissue instead. If there were fewer than three gland fields in the tissue obtained from the prostate, the biopsy was also considered inadequate although it was realized that the needle may have entered an area of fibromuscular preponderance rather than epithelial hyperplasia. In these cases, whenever possible, the biopsy was repeated.



2. Tissue adequate for diagnosis. Since the presence or absence of carcinoma was of prime interest, these cases were further subdivided as follows: (a) no carcinoma seen; (b) suspiciously malignant; (c) carcinoma.

A total of 103 patients were studied in whom 121 biopsy attempts were made. In 20 cases a single biopsy which was not repeated was unsatisfactory for diagnosis leaving 83 cases for consideration. In the 83 cases to be considered there were 5 biopsies which were inadequate, but in these cases the biopsies were repeated and tissue adequate for diagnosis was obtained.

discovered when the surgical specimen was examined. Of the two cases of occult carcinoma in this group, the biopsy made the diagnosis in one case, and failed in the other.

The biopsy diagnosis of the 7 cases with indurated areas of questionable etiology (Group II) were: benign 2, suspicious 4, carcinoma 1. Of the 2 cases in which the biopsy was diagnosed as benign, one was subsequently operated upon and the surgical specimen did not show evidence of malignancy. None of the 4 cases with the suspicious biopsy would consent to surgery to permit the establishment of diagnosis, and al-

TABLE I.

Group	Number of cases	Clinical diagnosis	Biopsy diagnosis	Surgical diagnosis	Number of carcinomas	Carcinomas diagnosed by biopsy
I.	46	No evidence of cancer	Benign... 45	No surgery. 22	Benign... 22	2
				Surgery.... 23	Cancer... 1	1
			Cancer... 1			
II.	7	Indurated areas of questionable etiology	Benign... 2	No surgery. 1		
				Benign.... 1		
			Suspicious 4	No surgery. 4		1
			Cancer... 1	Cancer.... 1	1	
III.	3	Early cancer	Cancer... 3	No surgery. 1		
				Cancer.... 2	3	3
			Benign... 2	Cancer.... 2		
IV.	27	Diffuse induration Suggesting late Cancer*	Cancer... 25	No surgery. 18		
				Cancer.... 7	27	25
Totals:	83				33	30

\*A clinical diagnosis of late carcinoma was made in 26 cases, and of stones in the prostate in the remaining case.

Of the 83 cases in which the biopsy could be evaluated, 46 belonged to Group I, 7 to Group II, 3 to Group III, and 27 to Group IV. In 45 of the 46 cases in Group I, the biopsy was reported as no carcinoma seen and in the remaining case carcinoma was found. The latter case represents one of occult carcinoma and will be referred to later. Twenty-two of the 45 cases in which the biopsy report was no carcinoma seen had a prostatectomy and the examination of the surgical tissue showed no evidence of carcinoma. In an additional 22 cases surgery was not necessary and thus confirmation of the biopsy diagnosis was not available. In the remaining case the biopsy failed to make the diagnosis of carcinoma, the occult malignancy subsequently being

though the biopsy was repeated on several occasions in each case, a definitive diagnosis could not be made. These patients were in the younger prostatic age group (50 to 60), were having no urinary symptoms, the indurated areas having been detected on routine physical examination. The case which showed carcinoma in the biopsy was subsequently operated upon and the malignancy was again seen in the tissue removed.

The biopsy made the correct diagnosis in each of the three cases of early carcinoma of Group III. Two of the patients underwent radical perineal prostatectomy, and in the remaining case this operation was contra-indicated due to advanced age and associated cardio-vascular disease.

In the 27 cases in Group IV, the prostate was fixed, irregular, and markedly indurated. The findings of the rectal examination suggested the diagnosis of late carcinoma of the prostate in 26 of the cases, while in the other case, because calcification was noted in the region of the prostate on x-ray, a diagnosis of calculous prostatitis was made to account for the induration in the gland. The biopsy was diagnosed as carcinoma in 25 cases and as benign in two; the latter diagnosis included the case with stones in the prostate previously mentioned. Both of the cases in which the biopsy was diagnosed as benign were operated upon and the surgical specimens showed carcinoma in each case. Only 7 of the 25 cases in which the biopsy showed carcinoma required surgery (transurethral resection) for the relief of obstructive urinary symptoms, and in the remaining 18 cases the biopsy was used as the sole means of establishing diagnosis.

Table I summarizes the results.

Of the 33 cases of carcinoma in the series, two were classed as occult, three as early, and 27 as late. A diagnosis of carcinoma based on the rectal findings was made in 30 patients, the diagnosis being missed in the two cases of occult carcinoma in Group I, and in the patient with stones in the prostate in Group IV. The rectal examination therefore had a percentage of diagnostic accuracy for carcinoma in this series of 90.9%. The biopsy failed to make the diagnosis of carcinoma in 3 patients (1 case in Group I and 2 in Group IV). Thus the percentage of accuracy for the biopsy was identical with that of the rectal examination. An elevated serum acid phosphatase was found in 6 of the patients with carcinoma, the test thus having been useful in 18%.

**Complications.**—The most serious complication noted was the development of severe bleeding in two patients. Evacuation of clots and catheter drainage for 48 hours was necessary in each case. In two patients who underwent suprapubic exposure of the bladder subsequent to the biopsy, a marked fibro-fatty reaction was noted surrounding the bladder. It was felt that this was likely due to organized blood clot resulting from the biopsy. On four occasions a temperature elevation to 101° followed the biopsy but this subsided without treatment in 48 hours. The needle entered the rectum or the bladder on several occasions without causing any apparent after effects.

## DISCUSSION

Rational therapy is dependent on accurate diagnosis. A biopsy provides pathological confirmation of suspected malignancy thereby establishing diagnosis. But complete reliance can be given to the biopsy only if the tissue submitted contains malignant cells. In short, a negative biopsy does not rule out the existence of carcinoma in the gland. As experience with the technique of the procedure is gained, the more accurately will the areas of induration be entered with the needle. The larger the lesion and the closer it is to the apex of the gland, the easier will it be to guide the biopsy needle into an area of induration.

The usefulness of needle biopsy of the prostate must be judged in the light of its use as a diagnostic aid. If its limitations are appreciated, it will be found to be an extremely valuable assistant in the clinical management of patients with carcinoma of the prostate in all stages of development. To help assess its value, answers to the previously proposed questions will now be discussed.

A consideration of the case studies to be presented will adequately demonstrate that the needle biopsy provides tissue satisfactory for diagnosis. Although the tissue submitted may be satisfactory for diagnosis, as was mentioned previously, it may not be representative. Fig. 1 is the low power view of a needle biopsy of a patient diagnosed clinically as late carcinoma of the prostate. The tip of the specimen shows a cluster of malignant cells. These carcinomatous cells are better seen in the next figure which is a high power view of the malignant area. In no other portion of the specimen submitted were malignant cells found. It is readily appreciated that the biopsy needle, by the slightest alteration in its direction, could have failed to incorporate this cluster of cells in which case the pathological diagnosis would have been, no carcinoma seen.

Occult carcinoma was present in two of the patients in this series. Fig. 3 shows the biopsy in one of these cases. The biopsy was done as part of a routine carcinoma work-up in an 83-year old coloured male whose urinary symptoms and prostatic obstruction were minimal, and in whom conservative therapy was planned because of marked cardiac disease. Serum phosphatases, bone x-rays, and the rectal examination gave no clue as to the existence of the malignancy.



nancy which was brought to light by the biopsy. To determine the extent of the malignant process and to help decide whether or not tissue removed by transurethral prostatic resection would have contained carcinomatous cells, a transurethral biopsy was done and once again the malignant cells are seen. Should a needle biopsy be done on all patients being studied for prostatic disease in the absence of findings on rectal examination suggestive of malignancy? Although it has been demonstrated that it is possible to detect occult

noted in the left lobe of the prostate and during his convalescence, urological consultation was requested. The patient had had a suprapubic prostatectomy six years previously and at that time the tissue showed no evidence of carcinoma. The nodule was about 2 cm. in diameter and of grade 2 induration (*i.e.*, of a consistency usually associated with chronic prostatitis). The patient was having no obstructive urinary symptoms, the serum phosphatases were normal, and the x-ray of bones showed no evidence of meta-

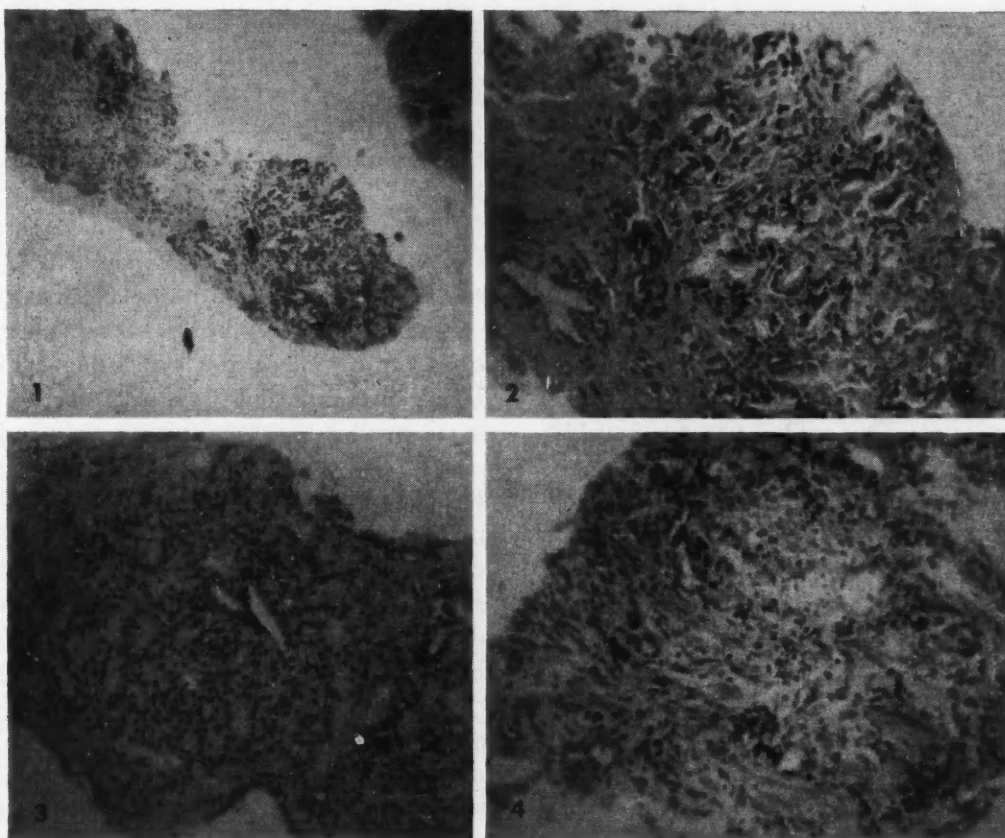


Fig. 1.—Low power photomicrograph of the needle biopsy of a patient with late carcinoma of the prostate. Note cluster of malignant cells at the tip of the specimen. Fig. 2.—High power view of malignant area seen in Fig. 1. Fig. 3.—Needle biopsy of a patient with occult carcinoma of the prostate. Fig. 4.—Needle biopsy of a patient with a nodule in the prostate of questionable etiology. The malignant cells are seen best at the periphery of the specimen. Biopsy diagnosis of carcinoma confirmed by examination of surgical specimen.

carcinoma by the biopsy, the chances for success in any individual case is so remote that its routine use is not warranted.

The needle biopsy would find its greatest field of usefulness if it could be shown that small isolated, indurated areas in the prostate (Group II) suspected of being malignant could be biopsied with accuracy. Fig. 4 shows the needle biopsy of a patient who was admitted to hospital with the diagnosis of acute cholecystitis and who underwent cholecystectomy. In the preoperative rectal examination a nodular area of induration was

stases. Clinically the lesion was classed as suspiciously malignant (Group II). Needle biopsy of the indurated area showed the lesion to be malignant.

In the next case, the distal half of the right lobe of the prostate was indurated to a degree usually associated with carcinoma (grade 4 induration). The gland was still movable, the serum phosphatases normal, and no evidence of metastases could be demonstrated in x-rays of the bones. A diagnosis of early carcinoma of the prostate was made. The patient was considered

a suitable candidate for a radical perineal prostatectomy should his lesion prove to be malignant. The needle biopsy, shown in Fig. 5, confirmed the clinical diagnosis, and radical prostatectomy was subsequently performed.

The extensive infiltration of the malignant process in cases classed as late carcinoma of the prostate offers an easier target to hit with the needle than is the case with the smaller earlier malignancies. A needle biopsy in these late

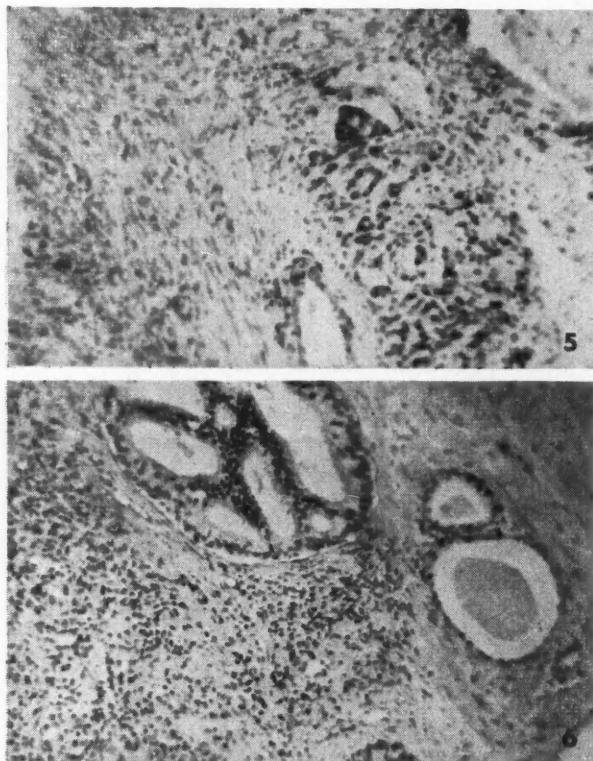


Fig. 5.—Needle biopsy of a patient with an early carcinoma of the prostate. Biopsy confirmed clinical suspicion and patient subsequently underwent radical perineal prostatectomy. Fig. 6.—Needle biopsy of a patient with late carcinoma of the prostate. The infiltration of the malignant cells into an area of benign hyperplasia is well seen. This patient did not require relief from obstructive urinary symptoms by transurethral resection, and the biopsy served as the sole means of establishing diagnosis.

cases is of value to establish diagnosis when relief from obstructive urinary symptoms by transurethral resection is not necessary. For medico-legal reasons, histological confirmation of the diagnosis is a wise precaution when orchiectomy is planned for therapy. The infiltration of malignant cells into an area of hyperplasia is shown in Fig. 6, which is the needle biopsy of a patient with late carcinoma who underwent orchiectomy but did not need relief from obstructive urinary symptoms by transurethral resection.

As was stated previously, a negative biopsy does not rule out the existence of carcinoma. Under such circumstances clinical judgment must guide subsequent investigation. If the needle biopsy on two attempts fails to find carcinoma cells in a patient who clinically is strongly suspected to have an early carcinoma of the prostate, the prostate is exposed perineally and an excisional biopsy obtained for frozen section examination, all preparations necessary having been made for radical prostatectomy should the lesion prove to be malignant. Many urologists question the value of the needle biopsy in patients with suspicious early malignancies of the prostate. They argue that perineal exposure of the gland with excisional biopsy and frozen section examination establishes diagnosis of the lesion with certainty, thus obviating the need for the needle biopsy which in some cases may fail to diagnose the malignancy. If one accepts the fact that a needle biopsy which fails to find carcinoma in a clinically suspected malignancy does not rule out the possibility of carcinoma being present, and uses the excisional biopsy as a further step in the management of these cases, the value of the biopsy can be defended. The fact that the needle biopsy may not remove carcinomatous tissue in an individual case is counterbalanced by the possibility that such tissue can be removed, as has already been demonstrated. The technique is simple, quickly executed, and can be done in the office,<sup>9</sup> or on the ward. Excision biopsy requires operating room facilities and operative consent. The latter may prove difficult to obtain as was the case with four patients in this series (Group II). The patients with a suspected early malignancy are either free from or have minimal urinary symptoms and are usually in the younger prostatic age class (50 to 60 years). Such patients are reluctant to submit to an operation to establish the diagnosis for a condition which is not causing marked symptoms and which was probably discovered incidentally in a general physical examination. The report of a needle biopsy positive for carcinoma sheds new light on the situation and would prove of value to the patient in deciding in favour of surgical therapy. The pathological report from the examination of the needle biopsy is based on hæmatoxylin and eosin stained sections. On occasion the pathologist is reluctant to give a definite diagnosis from frozen section examination and requests routinely



stained sections. Under such circumstances the surgeon can elect to close the wound and re-operate later if necessary or proceed with the radical operation basing his decision on an evaluation of the clinical findings and the gross pathology. The latter would be dangerous and the former may be avoidable by the use of the needle biopsy.

#### SUMMARY AND CONCLUSIONS

The results obtained from a needle biopsy incorporated as part of the clinical study of 83 patients with prostatic disease has been presented. The technique, complications, and limitations of the procedure were discussed. Case studies and photomicrographs were used to demonstrate that a needle biopsy can obtain tissue adequate for the diagnosis of carcinoma of the prostate in all stages of development. With experience the operator becomes proficient in his

ability to accurately biopsy lesions suspected of being malignant, due consideration being given to the fact that the procedure is guided by touch alone. The chief limitation to its usefulness is the fact that a negative biopsy does not rule out the existence of carcinoma. If it is appreciated that the needle biopsy remains a diagnostic aid and thus subsidiary to clinical judgment, it will be found to be of value in the management of patients with carcinoma of the prostate.

#### REFERENCES

1. FERGUSON, R. S.: *Am. J. Cancer*, 16: 783, 1932.
2. ALBERS, D. D. et al.: *J. A. M. A.*, 139: 299, 1949.
3. HERBUT, P. A.: *Am. J. Clin. Path.*, 19: 315, 1949.
4. PETERS, H. AND FRANK, I. N.: *Surg., Gynec. & Obst.*, 94: 69, 1952.
5. FERGUSON, R. S.: *J. Urol.*, 37: 774, 1937.
6. PEIRSON, E. L. AND NICKERSON, D. A.: *New England J. Med.*, 228: 675, 1943.
7. RINKER, J. R. AND SHUMAN, W. G.: *J. Urol.*, 67: 709, 1952.
8. YOUNG, H. H.: *Lewis' Practice of Surgery*, Hagerstown, Md., W. F. Prior Co. Inc., 1951, Vol. IX, Chap. 21, p. 19.
9. LEWIS, L. G.: Personal Communication.

## Case Reports

### TRIPLE CARCINOMA OF THE LARGE BOWEL\*

W. M. EAGLESON, M.D., *Hamilton, Ont.*

MULTIPLE PRIMARY MALIGNANCIES in various organs of one person, occurring at the same or different times, have been reported frequently. Malignant tumours of similar histological appearances occurring in the same organ at the same time are much rarer. This is the report of a patient having three simultaneous primary carcinomas of the colon.

The patient, a 64 year old woman, was admitted to the gynaecological service of the Hamilton General Hospital on February 25, 1953, because of intermittent, left, lower abdominal pain which had been present for three weeks. She had not noticed any change in her normal daily bowel movement, except for a feeling of incomplete evacuation which had bothered her for three weeks. The patient had not been using any laxative, and had never seen blood in the stools.

She had had rheumatic fever at 17 years of age, and during the past twelve years had been confined to bed on three occasions because of dyspnoea and tachycardia, the last time being for three months. She had been taking digitalis for six years. During the past 6 years her

weight had dropped from 189 to 100 lb., most of this being lost during the year prior to admission.

On admission, the patient appeared very thin and chronically ill. There was a mitral diastolic murmur, and the heart was fibrillating. Abdominal examination revealed no masses and only slight tenderness in the left lower quadrant. On pelvic examination a firm, somewhat fixed mass was palpable high in the left side of the pelvis, and was considered by the gynaecologists to be arising outside of the reproductive organs. Both legs showed marked varicose veins with acute thrombophlebitis of the left leg. The haemoglobin was 60%.

The stools gave a negative guaiac test on three occasions, and a 2+ reaction once. A sigmoidoscope could not be manoeuvred past six inches, and no lesion was seen. A barium enema demonstrated a constricting lesion involving a two-inch length of the sigmoid colon. The barium was not allowed to flow past the splenic flexure because of the danger of obstruction in the sigmoid.

A preoperative diagnosis of carcinoma of the sigmoid colon, rheumatic heart disease with mitral stenosis and atrial fibrillation, and thrombophlebitis of the left leg was made.

The thrombophlebitis subsided with bed rest and dicoumarol. Two grams of sulfasuccidine were given orally three times daily for seven days, and one gram of streptomycin orally twice daily for two days preoperatively. A Cantor tube was introduced the day before operation.

On March 25, 1953 under pentothal, cyclopropane, and oxygen anaesthesia, the abdomen was opened through a left rectus muscle-reflecting incision. A tumour measuring about 7 cm. in diameter involved the midpoint of the sigmoid colon, and was invading the back of the uterus. A second tumour approximately 6 cm. in diameter was found filling the caecum, and a third, smaller, annular tumour was discovered in the hepatic flexure. No metastases could be palpated or seen in the liver, and there were no grossly involved nodes in the regional lymphatics. A slightly enlarged lymph node in the mesentery near the caecum was negative for malignancy on quick section.

\*From the Department of Surgery, Hamilton General Hospital.

It was felt that we were dealing with three primary carcinomas of the colon, and the operation had to be planned with the patient's uncertain cardiac status in mind. After first considering a palliative ileo-sigmoidostomy to by-pass the three lesions, it was decided to begin with a right hemicolectomy, and to proceed further depending on the patient's condition.

The patient tolerated the right hemicolectomy and end-to-end ileotransverse colostomy well and, therefore, the lesion in the sigmoid was freed from the uterus and resected, doing an end-to-end anastomosis. The patient's condition was still satisfactory, and the operation was completed by doing a subtotal hysterectomy and bilateral salpingo-oophorectomy. Convalescence was complicated by pneumonia which developed on the 5th day and responded well to intravenous aureomycin and aerosol terramycin. A copious, clear, yellow discharge from the incision gradually subsided. Threatened bowel obstruction characterized by occasional bouts of crampy pain and distension also subsided.

The patient was allowed to get up on the 10th post-operative day, and went home on the 25th day.

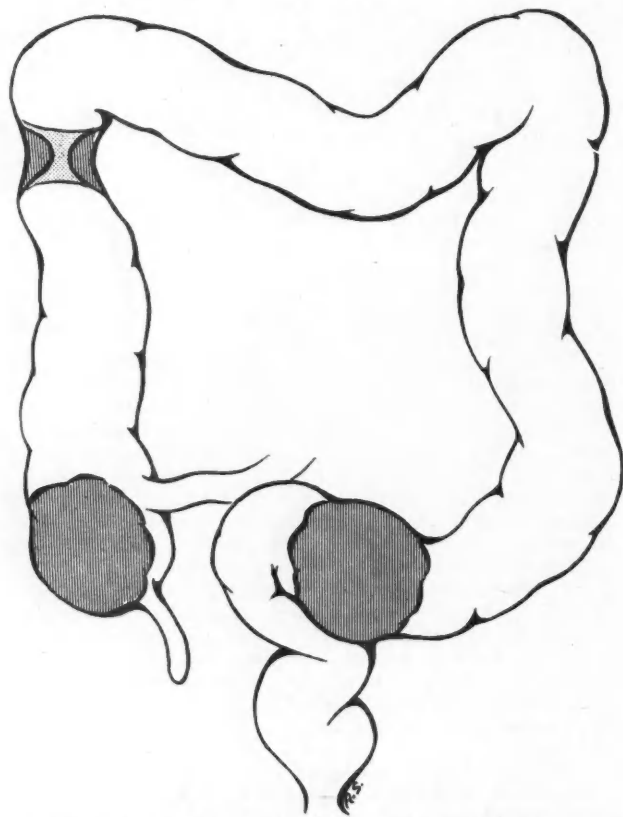


Fig. 1.—Diagram illustrating sites of the three tumours.

**Pathology.**—The lesions in the cæcum and sigmoid colon were sessile, fungating, ulcerated tumours measuring approximately 6 cm. and 7 cm. in diameter respectively, while that in the hepatic flexure was a stenosing ulcer with a raised indurated margin, involving three-quarters of the circumference of the bowel. No polyps were present in the colon.

Histologically the three tumours were adenocarcinomas of similar appearance, and each invaded the whole thickness of the bowel wall. Several mesenteric lymph nodes from each of the

three areas were examined, and were free of secondary malignancy.

**Discussion.**—A review of the reported cases of multiple carcinoma of the colon revealed an incidence ranging from 0.6%<sup>5</sup> to 4.6%<sup>4</sup> of carcinomas of the colon. The great majority of these were double tumours, only a few cases having three carcinomas.<sup>4, 6</sup>

The relationship of polyps to carcinoma has been considered. Out of 84 autopsies on patients with carcinoma of the colon reported by Berson and Berger,<sup>4</sup> polyps occurred in 25% of those with single carcinomas, and in 37.5% of sixteen cases of multiple carcinoma. Polyps occurred in only 16% of non-cancerous patients reported by Mayo.<sup>6</sup>

It is interesting that in several cases reported in the literature,<sup>1, 2, 3</sup> as in ours, no obvious lymph node involvement had occurred in the presence of multiple large tumours. This, together with the above statistics, suggests that multiple carcinomas frequently have their origin in pre-existing polyps.

#### SUMMARY

1. The case history of a 64 year old woman with three simultaneous primary carcinomas of the colon which were successfully resected in one stage is presented.

2. Multiple carcinomas of the colon are not uncommon, and this fact should be kept in mind when operating on any patient with carcinoma of the large bowel.

Acknowledgment is made to Dr. Goldwin Henry for his assistance in treating the patient and preparing this report, and to Miss A. Scott for preparing the illustration.

#### REFERENCES

1. MCARTHUR, G. C.: *Canad. M. A. J.*, 61: 1666, 1949.
2. REICKMAN, H. R.: *Am. J. Surg.*, 75: 275, 1948.
3. HERRLIN, J. JR. AND MERSHEIMER, W. L.: *Am. J. Surg.*, 59: 126, 1943.
4. BERSON, H. L. AND BERGER, L.: *Surg., Gynec. & Obst.*, 80: 75, 1945.
5. BEHREND, M.: *Surg., Gynec. & Obst.*, 65: 505, 1937.
6. MAYO, C. W.: *Proc. Mayo Clin.*, 17: 181, 1942.

In psychiatric research the critical limitation is the fact that most research is being carried on by men who are humanly, scientifically, and psychiatrically immature, or by older men who have never lost their amateur standing, or in the left-over fragments of time of men who are overburdened by administrative, educational, and therapeutic responsibilities. Some are professionally sophisticated in one field, some in another, but for the research band as a whole there are few mature players and no mature conductors. This is a manpower problem which must be solved if we are to bring psychiatric research up to the level which it must attain.—L. S. Kubie: *J. Med. Educ.*, 28: 27, 1953.



## CONGENITAL MICROCOLON

JULES LAVOIE, M.D.,  
St-Georges de Beauce, P.Q.

CASE REPORTS of congenital microcolon in the medical literature are very scarce, for the simple reason that this condition is extremely rare. According to authors on the subject, the incidence is one for 500,000 post-mortems and perhaps less. This malformation is usually accompanied by one or many other anomalies, so that these infants live only a very short time.

To my knowledge, no case of survival has been reported in which the whole colon was affected. In the congenital microcolon, the whole colon, or only the right colon, is extremely narrow in diameter, but histologically, it is a perfect colon in miniature.

Many theories have been advanced to explain the origin of the microcolon, but none may be seriously considered. Evidently, this condition produces, shortly after birth, an acute obstruction that can be only temporarily relieved by ileostomy; dehydration and the other abnormalities soon are fatal.

On account of the rare occurrence of congenital microcolon and its unknown causation, we believe the following case of our own deserves to be published.

On March 13, 1953, Raymond P., an infant of two days, was brought to hospital for vomiting of twenty-four hours' duration and because he had had no stool since his birth.

The delivery, at home had been a bit difficult on account of the abnormal volume of the abdomen. The physical findings, except for the rather large abdomen, were negative; the genital organs and the anus were also normal.

According to the father, the baby had no stool but he voided his bladder normally. During the examination, the infant vomited a certain amount of meconium. A tentative diagnosis of bowel malformation, probably on the rectal portion, was made, and the baby taken to the x-ray department.

With the child in upside down position, lipiodol was injected through the anal canal and two films taken within a few minutes; it was necessary to proceed rapidly because the baby was becoming cyanotic. The lipiodol did not pass by the rectum and the films showed a large fluid level high in the abdomen. A diagnosis of rectal atresia was done and operation decided on at once.

The abdomen was opened through a left paramedian incision above and below the umbilicus. Much to our surprise, it was filled up to the diaphragm by a smooth, rather tense cyst-like tumour; to gain access into the abdomen, it was necessary to open that huge sac. Then, and then only, we realized that it was the bladder. Was there any obstruction impeding the normal outflow of urine? A tiny sound was passed through the urethra and went up without difficulty into that monstrous bladder. After complete evacuation, it was closed in two layers

with 00 chromic catgut. Thereafter, it was possible to explore the abdominal content and here were the findings.

The colon was abnormal in situation and diameter. The distal part of the rectum was normal, but, from there, the colon was reduced to a small cylinder of about half an inch in diameter; the usual rotation had not been accomplished so that the whole colon, along with the appendix, the ileocaecal valve and the last portion of the ileum, was in the left side of the abdomen.

Moreover, the four last inches of ileum were replaced by a rigid cord smaller than the colon; the appendix was very small. Two other segments of bowel were in a state of atresia, namely three inches in the middle portion of the jejunum and six inches in the first jejunal portion.

Between these abnormal parts, the intestinal loops, containing meconium, were somewhat distended.

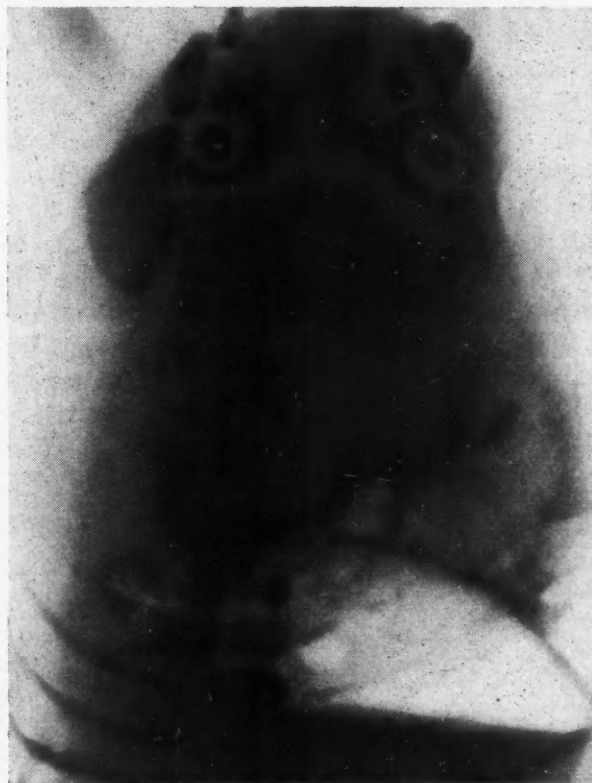


Fig. 1.—Lipiodol injected through the anal canal with the child in upside down position. Note the fluid level high in the abdomen.

Evidently, life was impossible; an ileostomy was done proximal to the ileal atresia and the abdomen closed in layers. The urethral sound was left *in situ*. The vomiting did not stop until death two days later; the intestines, from the duodenum to the rectum, and the bladder were then excised for pathologic examination.

Macroscopically, the findings were identical with those in the operating theatre; the jejunum and ileum were 50 inches in length and the colon 24 inches. Microscopically, the appearance of the bowels, that of the colon as well as that of the small intestine, was normal. In the bladder, the muscular layers were much hypertrophied, but the mucosa was atrophic with the corium presenting a very marked congestion. The bladder condition was probably produced

by the disease called congenital vesical sphincteric stenosis and was due to a defect of the neuro-muscular mechanism concerned in micturition.

It does not seem impossible that the bowel condition was also due to a defect of the neuro-muscular mechanism of the intestines.

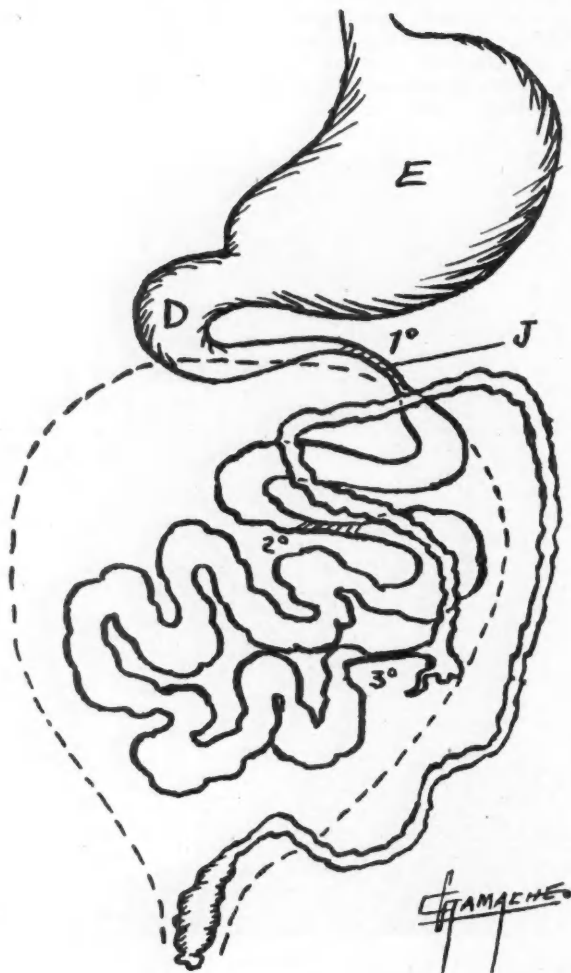


Fig. 2.—A drawing to show the digestive tract with the position of the different portions of the intestines at the operation. E—Stomach; D—Duodenum; J—Jejunum. 1°, 2°, 3°—Segments in atresia on the small bowel. In dotted lines, the full bladder.

#### SUMMARY

1. A case of congenital microcolon with atresia of three portions of the small bowel and congenital vesical sphincteric stenosis is described.

2. The origin of the condition is perhaps due to a defect of the neuro-muscular mechanism concerned in micturition and bowel function.

#### REFERENCES

1. AIRD, I.: Companion in Surgical Studies, p. 718.
2. EWING, J. B. AND COOKE, W. E.: *Brit. J. Surg.*, 25: 506, 1938.
3. ILLINGWORTH AND DICK: Textbook of Surgical Pathology.
4. PORTER AND WEEKS: *Am. J. Dis. Child.*, 9: 283, 1915.

## SPONTANEOUS PNEUMO-HÆMOTHORAX\*

R. T. TOWSON, B.A., M.D., *Kitchener, Ont.*

EIDINGER and Rubin<sup>1</sup> have recently described three cases of spontaneous pneumo-hæmorrhax. These authors briefly review the literature of the condition, finding some 138 reported cases in all. They state that spontaneous pneumo-hæmorrhax not associated with demonstrable pleuropulmonary disease is a rare occurrence, and this undoubted fact prompts the present report of a case recently encountered.

N.R., a 27-year old, married woman of Irish extraction was admitted to Freeport Sanatorium on January 13, 1953, and gave a history of a dragging pain of slow onset in the left shoulder region two weeks previously, which steadily increased. She consulted her family doctor on January 6, when the physical signs suggested lobar pneumonia, and she was given an injection of penicillin. No improvement occurred, however, and a chest film on January 9 revealed a left-sided chest lesion which was felt to warrant sanatorium investigation.

On admission she had few complaints, apart from anorexia and recent slight loss of weight. She had no cough, sputum or chest pain. There was no significant previous medical history. Clinical examination revealed a fresh, well nourished, pleasant girl who did not look ill and showed no dyspnoea. Temperature was 99° F., pulse 86, respiration 22. The chest showed diminished movement over the right side, with dullness to percussion and absent breath sounds at the base anteriorly and posteriorly, and diminished breath sounds on the left side.

Examination of the other systems revealed no essential abnormality. The intracutaneous tuberculin test was strongly positive to 1/20 mgm. of old tuberculin. Chest films showed a small pneumothorax over the upper half of the left lung, and a dense homogeneous opacity on the same side up to the third rib anteriorly. The mediastinum was displaced one inch to the right, and the right lung was clear except for one or two calcified foci in the hilum. Urinalysis showed no abnormality; blood examination revealed a hæmoglobin level of 58% (Sahli); R.B.C. 3,250,000, W.B.C. 10,500, polymorphs. 75%, lymphocytes 24%, eosinophils 1%, basophils nil; erythrocyte sedimentation rate (Westergren) 130 mm. in the first hour.

She had no sputum and gastric lavage failed to reveal tubercle bacilli on smear or culture. Thoracentesis revealed frank unclotted blood and 16 ounces were withdrawn. Penicillin intrapleurally and intramuscularly was administered, and a further 16 ounces of blood removed the following day. Six days later 6 ounces of thin blood stained fluid were withdrawn, and fluoroscopy showed that the lung had completely re-expanded. At this point fluid ceased to re-accumulate, and the radiographic appearances rapidly returned to normal. The lung had completely re-expanded, and the contour of the left diaphragmatic cupola was smoothly rounded, with an open costophrenic angle. Blood examination at this time showed 75% hæmoglobin (Sahli); R.B.C. 4,120,000; W.B.C. 8,750; polymorphs. 48%, lymphocytes 44%, monocytes 6%, eosinophils 1%, basophils 1%, and the erythrocyte sedimentation rate had fallen to 38 mm. in the first hour.

\*From the Freeport Sanatorium, Kitchener.



No pyogens were grown from the fluid, and culture and guinea pig inoculation failed to disclose the presence of tubercle bacilli. Her general condition rapidly improved, and she was discharged home on February 20, 1953, 38 days after admission.

She was seen as an out-patient one month and four months after discharge, and remains subjectively and clinically very well. Serial chest films show no evidence of active chest disease.

This case differed in some interesting, if minor, points from the classical picture as reiterated by Eidinger and Rubin. The onset was slow, and she could not report any initial sudden pain which might have indicated the moment of rupture. Her pain was never very severe, nor was she ever acutely ill. No supportive treatment was required, and rapid and complete re-expansion of the lung was readily attained following three aspirations of blood and air.

#### SUMMARY

A case of pneumo-hæmothorax is described.

Some minor points of difference from the classical picture, which emphasize the need for diagnostic aspiration in all cases of pleural fluid, are noted.

#### REFERENCE

1. EIDINGER, S. L. AND RUBIN, E. H.: *Canad. M. A. J.*, 67: 43, 1952.

### SKELETAL METASTASES FROM CARCINOMA OF THE RECTUM\*

HARRY E. BACON, M.D. and  
C. COLIN JACKSON, M.D.,†  
Philadelphia, Pa.

ALTHOUGH METASTATIC spread from rectal carcinoma to regional lymphnodes and liver is generally appreciated, involvement of more distant sites is not uncommon and should no longer be considered unusual.<sup>2</sup> With the present tendency to broaden the criteria for operability, the greater will be the number of patients with hidden metastases. This is verified by the colonic surgeon who on occasion is confounded by the unusual appearance of secondary involvement after apparent operative cures have been obtained.

\*From the Department of Proctology, Temple University Medical School and Hospital.

†Formerly a Fellow in Proctology, Temple University Medical School and Hospital. Now practicing in Vancouver, British Columbia.

Skeletal metastasis from carcinoma of the rectum is not an uncommon finding. Although not as frequent as in carcinoma of the prostate, breast, thyroid, lung or kidney, its incidence is such that one should be constantly aware that it may occur either early or late in the course of the disease.

It was in 1870 that Curling<sup>7</sup> reported the first case of bony metastasis from carcinoma of the rectum—that to the radius. Hildebrande,<sup>3</sup> in 1887, cited a case involving the right femur. In 1897, Fuzinami<sup>4</sup> described a case with metastasis to the femur that caused spontaneous fracture. Metastases to ribs, vertebræ and femur from rectal carcinoma were recorded by Goetsch<sup>10</sup> in 1906. Nisnjewitsch<sup>13</sup> reported skeletal metastases in 10.5% of rectal cancers. This figure is based on findings of 57 autopsies in which bony involvement occurred in 6. Aufses<sup>1</sup> in 1930 added 8 cases to the 16 already reported in the literature. He believed the sites conform to those of von Recklinghausen<sup>15</sup> in his monograph on formation of bone metastases. The skeleton was the site of metastases 35 times in 24 of von Recklinghausen's cases (Table I).

TABLE I.

THE SKELETON WAS THE SITE OF METASTASIS 35 TIMES  
IN 24 OF VON RECKLINGHAUSEN'S CASES

Vertebrae.....	8	22.8%
Femur.....	6	16.8%
Ribs.....	6	16.8%
Skull.....	3	8.4%
Sternum.....	3	8.4%
Humerus.....	2	5.7%
Pelvis.....	2	5.7%
Sacrum.....	2	5.7%
Radius.....	1	2.8%
Scapula.....	1	2.8%
Ulna.....	1	2.8%

35

In 1938, Brown and Shields<sup>6</sup> stated that the incidence of bony metastases in their cases was 5%. They felt that local extension may account for some, but not most of skeletal metastases. Ghormley and Valls<sup>9</sup> in 1939 reported a further 29 cases of skeletal metastases from carcinoma of the large bowel, encountered mostly in bones of the trunk. Bacon<sup>3</sup> in 1940 reported 15 cases (excluding sacrum and coccyx) in a series of 366 cases, an incidence of 4.4%. If, however, the 40 cases of sacrum and coccygeal metastases are included, his incidence was 13.3%. Although Hubeny,<sup>12</sup> in 1940 found only one case in a series of 159 cases of carcinoma of the rectum (0.62%),

he ventured the opinion that the incidence is much higher, as all patients are not subjected to complete roentgenographic survey, nor is there always pathological confirmation. It is also felt that bony metastases may be present for a considerable period of time before their symptomatology leads to their discovery. In reviewing 600 cases of carcinoma of the rectum, we recently found 36 cases or 6% with skeletal metastases (Table II).

TABLE II.

IN 600 CASES OF CARCINOMA OF THE RECTUM, AUTHORS  
FOUND 36 CASES OR 6% WITH SKELETAL METASTASES

Bone involved	Number	Percentage of skeletal metastases	Percentage of 600 cases
Sacrum.....	14	38.8%	2.3%
Lumbar.....	13	36.1%	2.1%
Pelvic.....	8	22.2%	1.3%
Dorsal.....	6	16.6%	1.0%
Skull.....	4	11.1%	0.66%
Ribs.....	3	8.3%	0.5%
Sternum.....	1	2.7%	0.16%
Clavicle.....	1	2.7%	0.16%
Femur.....	1	2.7%	0.16%

Of the 36 cases, 20 were males and 16 females; a ratio of 5:4. In 16 cases the lesion was below the 4 centimetres level, and in 25 cases below the 6 centimetres level, indicating that the low lying lesions showed greater tendency to skeletal metastases than the high lying growths. These bony lesions are mostly osteolytic in type, although occasionally one of the osteoplastic type is noted. In spite of the relatively high incidence of bony metastases, we do not feel that one is justified in screening the skeletal system in each case of carcinoma of the rectum. Rather, the individual bone should be investigated as it produces symptoms.

Bony metastases are blood-borne and are due to lodgement of malignant emboli in the cellular marrow. As Piney<sup>13</sup> has pointed out, this occurs with few exceptions in the red marrow. von Recklinghausen<sup>15</sup> believed that metastases to bone were not due to embolic blocking of a vascular channel in the bone by a large mass of malignant cells, but rather by periaxial stagnation of neoplastic cells as they pass from the blood vessels outside the bony structure into the vascular bed situated within the bone. The blood vessels around the bone are of changeable size depending on stimuli such as temperature and activity, while vessels in the bone are fixed in

size. The blood is therefore often carried from a narrow peripheral vessel to a wider vessel within the bone marrow where neoplastic cells tend to stagnate and multiply. Owing to this manner of formation, bony metastases should occur most frequently in those bones subject to the greatest stress and strain as well as temperature change. Nisnjevitch<sup>13</sup> found the following frequency: vertebrae 28.9%; sternum 17.7%; femur 15.9%; ribs 14.7%; humerus 7.6%; skull 7.1%; pelvic bones 5.3%; tibia 1.1%; clavicle 1.1%.

Batson<sup>4, 5</sup> in 1940 clarified many of the paradoxes of metastatic spread to the skeletal system. From his studies on the cadaver and monkey, he considered the veins of the vertebral column, cranium and body wall a separate vein system, providing a by-pass around the portal, caval and pulmonary vein system, yet freely communicating with them. Batson describes the vertebral vein system as a blood reservoir where these valueless veins carry blood under low pressures. During coughing, straining or any increased activity, blood is not only prevented from entering the thorax and abdomen, but actually squeezed out into the vertebral reservoir. There is also a communication between the latter and the venae vasorum of the large vessels of the extremities.

The following case report is presented because of its unusual nature.

L.S., a 58-year old white male was admitted to the proctologic service at T.U.H. on December, 1949. Five days later he underwent an abdominoperineal excision of the Miles type with ileo-pelvic node dissection for an adenocarcinoma 1 cm. above the anorectal line. The pathologist's report was adenocarcinoma (mucoid-intracellular) with metastases to regional nodes. Subsequently a bilateral inguinal node dissection was carried out but no evidence of metastases was found. The patient returned in August 1950 for repair of an incisional hernia. In the following month a transurethral resection was performed with a report of benign prostatic hypertrophy.

During the fall of 1950 he required increasing amounts of sedation and was admitted as a terminal case December 21, 1950. He requested discharge January 3, 1951, but upon readmission February 2, a walnut-sized tumour was present on the right temporal region of the skull. The biopsy report was metastatic adenocarcinoma (Fig. 1).

On March 11, a similar growth presented on the medial aspect of the left clavicle. This too, proved to be adenocarcinoma on biopsy. On further x-ray osteolytic lesions were found in right ischium and pubis, left greater trochanter and third lumbar vertebra (Fig. 2). The patient rapidly became worse and expired March 26, 1951.

#### SUMMARY

1. Distant metastases from carcinoma of the rectum should no longer be considered unusual.



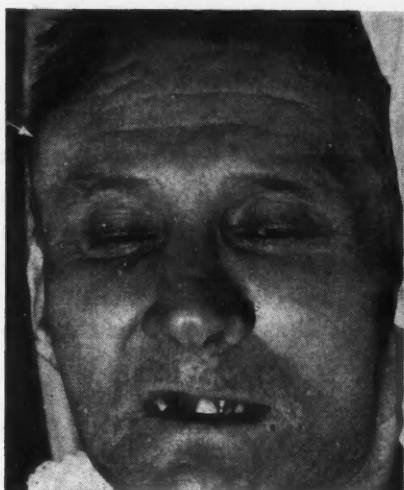


Fig. 1



Fig. 2

Fig. 1.—A walnut-sized tumour is evident on the right temporal region.  
Fig. 2.—X-ray film discloses osteolytic lesion of skull.

2. The incidence of skeletal metastases from carcinoma of the rectum is discussed.

3. Six hundred cases are reviewed in which 36 had skeletal metastases—an incidence of 6%.

4. A case of skeletal metastases to skull, clavicle, third lumbar vertebra, right ischium and pubis, and greater trochanter is reported.

#### REFERENCES

1. AUFSES, A. H.: *Arch. Surg.*, 21: 916, 1930.
2. BACON, H. E. AND JACKSON, C. C.: Metastases from Cancer of the Rectum: Report on 600 cases. To be published.
3. BACON, H. E.: *Pennsylvania Med. J.*, 43: 1573, 1940.
4. BATSON, O.: *Ann. Surg.*, 112: 138, 1940.
5. *Idem*: *Ann. Int. Med.*, 16: 38, 1942.
6. BROWN, C. E. AND WARREN, S.: *Surg., Gynec. & Obst.*, 66: 611, 1938.
7. CURLING, T. B.: *Lancet*, 1: 3, 1870.
8. FUJINAMI: *Arch. E. Path. Anat.*, 147: 129, 1897.
9. GHORMLEY, R. K. AND VALLS, J. E.: *J. Bone & Joint Surg.*, 21: 74, 1939.
10. GOETSCH, W.: *Betr. Z. Path. Anat. u. z. Allg. Path.*, 39: 218, 1906.
11. HILDEBRANDE, D.: *Deutsche. Ztschr. f. Chir.*, 27: 329, 1887.
12. HUBENY, M. J.: *Radiology*, 35: 315, 1940.
13. NISNJEVITSCH, L.: Inaugural Dissertation, Basel, 1907.
14. PINEY, A.: *Brit. M. J.*, 11: 792, 1922.
15. VON RECKLINGHAUSEN, F. D.: Festschr. der Assistenten zu Virchow zu 71st. Geburtsag, Berlin, 1891.

## BILATERAL ACCESSORY NERVE PARALYSIS\*

GODFREY L. GALE, M.B., F.R.C.S.(Edin.),  
Toronto, Ont.

THE FOLLOWING CASE demonstrates a remarkable recovery of shoulder function following permanent, bilateral, accessory nerve paralysis from excision of tuberculous cervical lymph nodes.

L.W., a Chinese man, first developed bilateral tuberculous cervical adenitis in 1929 at the age of 20. In 1930 nodes were excised on the left and an abscess was aspirated on the right. He was first admitted to the Toronto Hospital for Tuberculosis in September 1931. On admission he had minimal pulmonary tuberculosis, but never at any time had a positive sputum. Several firm nodes were present on both sides of the neck. An operative scar was present on the left and a discharging sinus on the right. Nodes were also palpable in the right axilla. He was treated with simple bed rest and the sinus healed.

\*From the Toronto Hospital for Tuberculosis, Weston, Ont.

In the Fall of 1932 the nodes were excised from both sides of the neck in two stages, and in each case the accessory nerve was permanently lost. There was also a transient weakness of the left facial nerve. The incisions healed well, but fresh nodes appeared in both mastoid regions, in the left sub-maxillary region and in both axillae. In March 1934, nodes were excised from the right axilla. He was discharged in August 1936, after having received 5 years of sanatorium care. There were still quiescent residual nodes present. There had been no recovery of function in either trapezius muscle, but he had found employment as an assistant electrician.

He was re-admitted in September 1939, with large nodes in the left sub-maxillary region and a discharging sinus in the left axilla. Pus from this sinus was positive for tubercle bacilli on culture. Tonsillectomy was performed and pathological section showed evidence of tuberculosis, though guinea pig inoculations were negative. Then in November 1939, the left submaxillary lymph nodes were excised together with the submaxillary salivary gland and part of the parotid gland. The mandibular division of the facial nerve was damaged, but slowly recovered. Lymph nodes were also excised from the left axilla. The incisions healed well, but further nodes appeared on the right side of the neck and in the right axilla. He was discharged in April 1940 with these nodes still present.

Early in 1944 he complained of difficulty in swallowing, and investigation showed a narrowing of the oesophagus at the level of the upper end of the manu-

brium sterni presumably due to scarring from the tuberculous lymph nodes. The œsophagus was dilated and he has no more dysphagia if he is careful to chew his food well. In the summer of 1944 a fresh tuberculous cervical abscess developed which was drained with final healing. He has been followed from time to time since then and has not so far developed any further tuberculous lymph nodes.

In the twenty years since both accessory nerves were lost he has recovered a remarkable degree of shoulder function. There is complete atrophy of both trapezius muscles with a line of

without undue fatigue. He can abduct both arms above his head by a curious sequence of abduction, external rotation and flexion at the shoulders (Fig. 2 to 4). He can work with one arm above his head, but quickly tires if he has to abduct both arms. He is employed in a pool room tidying lockers, and seems to be satisfied with his work. He has been advised that an operation to anchor the vertebral border of the scapula to the spinous processes, with trans-

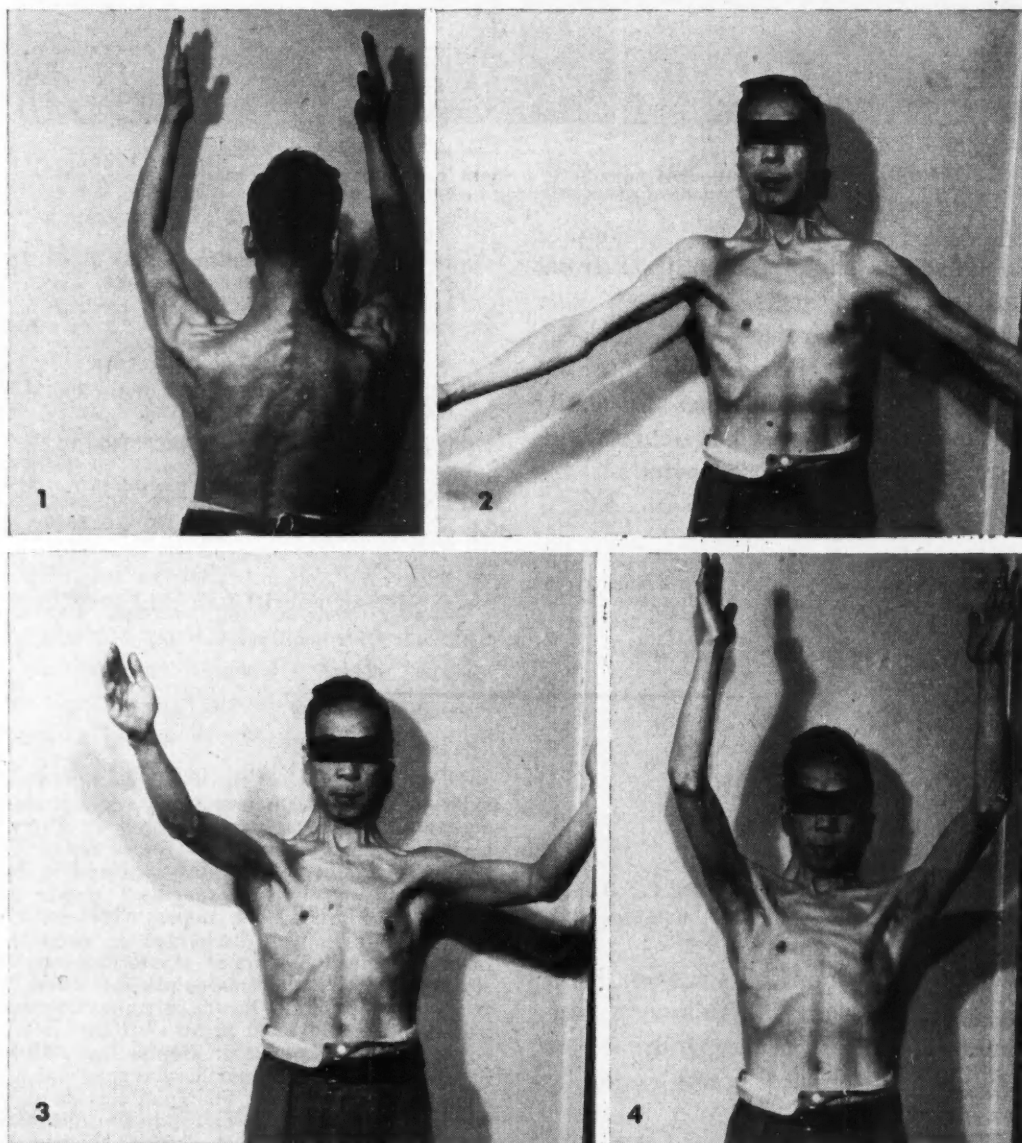


Fig. 1.—Posterior view showing absence of trapezius muscles and development of rhomboids and deltoids. Fig. 2.—Abduction of arms, first step, initial abduction. Note levator scapulae muscles. Fig. 3.—Abduction of arms, second step, flexion and external rotation. Fig. 4.—Abduction of arms, third step, abduction completed by swinging arms forward and upwards.

fibrous tissue under the skin along their anterior borders. Considerable hypertrophy of deltoids, rhomboids and levator scapulae muscles has taken place (Fig. 1). Standing in a relaxed position, both shoulders droop downwards and forwards, but he can brace them back for short periods

plantation of the levator scapulae to the axillary angle of the scapula, would improve his working capacity, but he has declined to have this done.

This case history also illustrates certain important points in the treatment of tuberculous lymphadenitis. This patient had six operations



for removal of nodes but, as the disease was not sufficiently quiescent, they were followed on each occasion by the appearance of fresh crops of infected nodes. Attempts at radical removal resulted in the loss of both accessory nerves. The ideal treatment today is sanatorium care with prolonged antibiotics and, when the disease is really quiescent, the local removal, if required, of any residual mass of nodes that may remain. Any attempt at radical resection of tuberculous cervical lymph nodes is too mutilating and too dangerous to be justified.

I wish to express my indebtedness to Dr. C. A. Wicks, Superintendent, Toronto Hospital for Tuberculosis, Weston, Ontario, to Dr. R. I. Harris, Consultant in Orthopaedic Surgery, and to Mr. R. H. Giffin for the photographs.

## APPENDIX EPIPLOICA

KEITH SCOUGALL, M.B., B.Ch.,  
*Spiritwood, Sask.*

BEARSE<sup>1</sup> recently reported on five cases of necrosis of appendices epiploicae, this relatively slight condition causing widespread constitutional disturbances including general peritonitis, paralytic ileus and even death. A case of this nature recently came under my care and I feel that a further report might be of interest to others who may encounter a similar diagnostic problem. It is not suggested that the condition is common, but I have seen no other mention of it in the journals and it is not described in any of the standard textbooks of surgery.

If my own case is in any way typical the condition is a fulminating one and the diagnosis clinically impossible. However, were the condition more widely recognized, it is probable that it would help to account for some of the cases of idiopathic peritonitis, the essential lesion of which is unrecognized even at laparotomy.

The patient J.D., a man of 68 was first seen at 11.45 a.m. October 24, 1952. He was holding his lower abdomen and writhing across a chair. He gave a history of nocturnal frequency for many years. A prostatectomy had been advised, but had been refused. Three days prior to admission he had experienced severe lower abdominal pain which had got steadily worse. The pain was continuous, with no exacerbations or remissions. He had not vomited. His bowels had been open regularly and his micturition had been normal for him, though he had not passed urine on the day of admission.

On examination he was disoriented and was obviously in severe pain. Examination and history were difficult as he was unco-operative, vague and persistently demanded relief of his pain. He held his lower abdomen continually, but could not localize his pain further. Temperature was 97.0°, pulse 72 and respirations 18. The tongue was dry and furred, his remaining teeth were in very poor condition and the breath foul but not faecal.

Respiratory and cardiovascular systems were clinically normal and his blood pressure was 160/85. The pupils were central, equal, regular and reacted to light and accommodation. Knee and ankle jerks were present and equal.

There was nothing remarkable on inspection of the abdomen. On palpation, both recti were in spasm, but could be made to relax momentarily. When relaxed a suprapubic mass half way to the umbilicus could be felt. The flat muscles were not in spasm and generally the impression given was not one of "board-like" rigidity. The abdomen was dull to percussion over the mass and normally resonant above it. Bowel sounds appeared normal. The prostate was enlarged firm and regular. The lower bowel was practically empty.

He was admitted to the Spiritwood Union Hospital with a diagnosis of acute retention of urine secondary to benign prostatic hypertrophy. A urethral catheter was passed without difficulty and 15 ounces of rather dark urine obtained. This was normal both chemically and microscopically. No more urine could be obtained and the removal of that quantity produced no relief from his symptoms at all. He was put to bed and given morphine gr. ½.

Shortly after noon he began to vomit and the vomiting increased in intensity and by 3 p.m. was almost faecal. At 1 p.m. he was given an enema which was returned with a small faecal content. At 2 p.m. a second enema was returned completely clear. A stomach tube was passed with Wangenstein drainage attached at 3 p.m. Up till this time the vomiting had been increasing, though there was no significant change in his general condition.

Laparotomy was decided upon. At 5.15 p.m. the abdomen was opened under general anaesthesia through a left lower paramedian incision. As soon as the peritoneum was opened thin seropurulent fluid welled into the wound. This was removed by suction and the abdominal contents examined.

Both large and small bowel were acutely inflamed and covered with small flecks of lymph. The jejunum and upper ileum were grossly distended and thickened. No cause of obstruction could be found and the bowel gradually became more normal and was collapsed by the time the ileo-caecal region was reached. The large bowel was collapsed.

The appendix could not be clearly seen, apart from the tip. The rest of it was bound down to the posterior abdominal wall by numerous adhesions. It was freed with difficulty and had to be removed. It was not felt that it could be responsible for the peritonitis.

The caecum and colon appeared normal. Some inches above the ileo-caecal junction a small piece of reddish tissue about 2.0 x 1.0 x 1.0 cm. was found. It was lying almost free in the peritoneal cavity, apart from a very fine thread of peritoneum to which it was attached. This snapped and its origin could not be determined. The significance of this piece of tissue was not appreciated, but it was removed for section.

All other abdominal contents were apparently normal. The bladder was again moderately distended and a large firm prostate could be felt through its posterior wall. The pelvic contents were not otherwise remarkable.

The peritoneum was drained and then closed with interrupted sutures. It was felt that the convalescence would be stormy and, as the bladder had filled up again, it was decided to do a suprapubic cystostomy rather than risk having to tie in a catheter *per urethram* in a patient whose preoperative mental condition had been far from satisfactory. The pouch of Retzius was drained and the abdominal incision closed in the usual way.

On the tenth day he was approached about a prostatectomy which he again refused. On the 13th day the suprapubic tube was removed. The cystostomy took a long time to heal, but he was finally discharged, quite dry, on December 4, 1952.

#### **PATHOLOGY**

The microscopic report received from the Province of Saskatchewan's Pathological Service, Saskatoon, was as follows: The gross specimen consists of an appendix measuring 7.5 cm. in length and varying in diameter from 0.4 to 0.6 cm. Tags of adhesions appear over the serosal surface and the vessels are moderately injected. A small amount of fat is attached. The lumen is patent throughout and contains soft faecal material.

There is an accompanying irregularly outlined mass of tissue measuring approximately 2.0 x 1.0 x 0.8 cm. and weighing 0.5 gram. Its surface varies from pale yellow to dark greyish-brown in colour. On cross-section, there is one fairly well circumscribed area measuring 1.0 cm. in diameter which has a dark yellow fatty appearance. It is rather soft in consistency. The remaining tissue is of a pale yellowish-grey colour and is moderately firm.

*Microscopically.*—In this appendix the submucosa is becoming moderately thickened in a patchy fashion due to an increase of fibrous and fatty tissue elements. An irregular fibrosis is also occurring in the subserosa and small fibrous adhesions are identified. The lumen in one segment is becoming distended with some compression atrophy of the mucosal membrane.

The accompanying fatty tissue is undergoing patches of necrosis. In these areas an inflammatory reaction is occurring with lymphocytes, plasma cells, histiocytes and fewer granular leukocytes accumulating in fairly large numbers. Some fibrosis is also occurring and the surface is covered by a thick layer of fibrin undergoing marginal organization.

*Diagnosis.*—(1) Subacute and chronic appendicitis (slight). (2) Fat necrosis of appendix epiploica.

#### **DISCUSSION**

The point which it is desired to emphasize is the slightness of the essential lesion compared with the severity of the results to which it can give rise. Even at laparotomy the true nature of this man's trouble was not identified. Had it been, we would have avoided a long and dangerous

search for the cause of his condition. If this disease is searched for, others might avoid similar dangers, though it is not seen how laparotomy can be avoided.

My thanks are due to Dr. J. W. Adams of the Pathological Service of Saskatchewan for permission to publish his pathological report.

#### **REFERENCE**

1. BEARSE, C.: *Am. J. Digest. Dis.*, 24: 1922, 1952; quoted from *Mod. Med. of Can.*, November, 1952.

## **Special Article**

### **SOME ASPECTS OF A UNIVERSITY'S WORK\***

SIR LIONEL WHITBY,† *Cambridge, Eng.*

TODAY'S CEREMONIES mark an important event in the history of the University of Toronto, and more particularly of its highly esteemed medical school.

We, the recipients of the degree of D.Sc. (*honoris causa*), are indeed honoured to receive the University's mark of distinction, and especially on this notable occasion, the opening of a great Institute which has been named to mark the achievements and contributions to medicine (and so to the University's reputation), by a famous man. Famous, indeed, but happily still preserving that innate modesty and humility, as well as, if I may be allowed so to say, the refreshing school-boy, Peter-Panlike outlook on life which has endeared him not only to the whole Commonwealth, but also to men of every nation. It is always the modest enquirer and not the presumptuous one who makes real and safe and enduring progress in the discovery of fundamental facts.

I have, however, to remember that Sir Henry Dale is batting first wicket down in this afternoon's ceremonies and it will be for him, if he wishes, to talk of Charles Best and of how his contribution to the discovery of insulin, which provided a new growing-point in the field of experimental therapeutics, brought a fresh wave of optimism into the hospital wards.

My prime duty is to express proper thanks and appreciation on behalf of this afternoon's graduates for the honour you have done us and this I do without reserve. I have, however, been

\*Address by Sir Lionel Whitby at a special convocation, University of Toronto, on the occasion of the opening of the Chas. H. Best Institute of Physiology, September 15, 1953.

†Vice-Chancellor, University of Cambridge, England.



given this opportunity of saying briefly, something of the thoughts which have passed through my mind on being invited to be an active participant in this important event. Naturally, those thoughts have ranged over the personality and achievements of Charles Best, but this particular aspect is not my province. I have thought, perhaps more deeply in the abstract, and especially of the significance of this event to the University and its impact upon its teaching and research.

In the first place, the University is fortunate in having a medical school of such great distinction, since the ambitions, spirit and achievements of a great Department can stimulate, nourish and foster the same outlook in its other Departments, whereupon knowledge is everywhere advanced, students are properly instructed and, to quote the Statutes of my own University, there is "promotion of the interests of the University as a place of education, religion, learning and research", or perhaps more euphonically and succinctly, as a place of life, liberty and learning. It is of education and research, of liberty and learning about which I may perhaps be allowed to speak for a few minutes.

As to education, it is always a prime duty of a University to teach and to send forth a due succession of fit persons to serve in Church and State. This school, undergraduate and graduate, has already an international teaching reputation. In the practical field it has given to the medical educationalist textbooks of physiology, pathology and anatomy which are household words, for the simple reason that they present the subjects from the aspect of the practising doctor, and the school has been realistic enough to make it its business to turn out into the world a due succession of capable, practical and knowledgeable medical men. It is in such a University that one looks for reform and experiments in medical education, such as the teaching of anatomy and physiology as one subject, the integration of different and often competing departments, and the elimination of the one-track mind which can only appreciate a narrow speciality.

Undergraduate teaching in these days presents formidable problems, demanding as it does the inclusion in the curriculum of constantly changing and ever expanding knowledge with different values, and the exclusion of outmoded subjects which ought regularly to be pruned or have their manner of presentation brought up to date. The burden weighs more heavily upon the student than the teacher but it could be lightened with advantage to all.

Factors which have a profound influence upon the quality of teaching are undoubtedly the size of the school, the student-staff ratio, and the individuality of the instruction. There is always a danger in medical schools of high reputation that their very success may eventually damage them by sheer weight of numbers. It might be expected that someone from one of our older British Universities would feel that the tutorial

system of teaching, small group teaching on a personal basis, is the ideal and is a very necessary supplement to what is taught to big groups. It may well be that such individual teaching will eventually come to be used again as the basis of medical instruction. I say "again" advisedly since it is not really so very long ago that teaching was entirely personal by apprenticeship. And it would seem that one practical solution to the insistent and ever-growing competitive demands of the specialties is that a small group of students should have a personal tutor, a guide, philosopher and friend, a man of wisdom and wide cultural knowledge who, at the end of a day's work could integrate the day's happenings in general terms bringing out the various aspects in right perspective—social, psychological, historical, technical and specialist—thus avoiding the danger of uneven, ill-balanced, departmental teaching. It may well be that a wise and cultural general practitioner could properly fulfil this most attractive rôle; at any rate the experiment would be worth trying.

So much for teaching, undergraduate teaching. What of research? Undoubtedly as with teaching there must be latitude for liberty and individuality. One can assume that this great new institute is wonderfully equipped for the prosecution of research under modern conditions and there can be no doubt that, with the inspiring leadership of its head, it will make outstanding contributions to scientific knowledge.

But it is interesting to enquire which of these two basic factors is the more important. Is it the extensive and spacious provision of modern equipment or is it the inspiration, guidance and urge derived from a leader? Such questions lead one to speculate upon what are the most important of the many factors which influence or inspire teachers, or stimulate research, or which advance knowledge, or achieve results, or indeed which fulfil the ideals and objects of a University.

We can, of course, be quite sure that, in the early days, neither Charles Best himself nor his colleagues had the facilities which the Professor of Physiology will now command and order, and I sometimes wonder whether, with the wealth of equipment which is now available, especially in this hemisphere, and often in commercial houses of great repute, it is not sometimes forgotten how much more important is the human brain than all the elaborate apparatus which modern science requires. This is especially true of a University which should identify and select the brains and then give them modest facilities for doing what they want to do in the way of original work, particularly to work out their own ideas. This is what is meant by liberty in a University, which is the antithesis of spoon-feeding. Like the educational side, the research departments should not grow too large, so that guidance of the student can be broad, general and individual.

I have always been interested in biographical literature, and especially in the biographies of great scientists. These tell in unmistakeable words of the importance of the man rather than the machine when, through the life-story, one comes to know the individual scientist, his strength and his weaknesses, his keenness and energy, his tenacity, courage and power of application, his instinct and intuitions, his intelligence and his stupidity, his successes and his failures.

There can be no doubt that the incalculable human element is vital and my own experience in widely differing positions in war and peace, has taught me that it is the odd and unselected assortment of individuals, sometimes even undisciplined, rather than the highly organized and selected teams which go to make a true University. In research, for example, it is usually to the individual that inspiration comes even though it may require a carefully-ordered team to exploit, expand or perfect the inspired idea.

Inspiration is most often born out of unconscious or uninhibited thought when the mind is merely idling or perhaps thinking of something quite different. Generally, subconsciously, there is also some stimulus such as the deliberate irritant effect left by a baffling problem or the sudden recollection of work previously done or the goading memory of some unusual occurrence of which the explanation was not apparent.

It is said that Fleming, when asked what he was working at when he found penicillin, replied he was not working at all, he was just playing about. A University should give men the liberty to play about, so that their imagination may have a chance.

*Midsummer Night's Dream* contains a passage which I have often used, for it is very appropriate.

And as imagination bodies forth  
The forms of things unknown, the poet's pen  
Turns them to shapes and gives to airy nothing  
A local habitation and a name.

Real imagination, real intuition, real interest in research needs the touch of the poet. High-powered efficiency with a one hundred per cent yield is not what is usually found in a University. There is indeed more in *Martin Arrowsmith* than just an enchanting story. Some of the men who properly and rightly are usually to be found in a University, but not in business or commercial work, either cannot, or should not, be made to work to rule or to a strict time-table, but I would be the first to agree, when dealing with youth, that though liberty is important and though the time-table may be governed by sweet reasonableness, it cannot be indefinitely postponed. I am quite sure, however, that, from the University angle, it is better to back a few wrong but promising horses than to concentrate upon mediocre certainties or to rely entirely or largely upon teams and committees.

Over-organization in research defeats its own ends. The organized team or the committee does not receive the imaginative or intuitive revelation that can come, perhaps rarely, to the individual, nor has the member of a team the same urge as someone working on his own.

I have always preferred the laboratory tea-party to the duly assembled committee for providing the proper atmosphere for new ideas or practical advice. Nevertheless, a properly constituted committee for research may fulfil most useful functions as a source of technical advice, for determining policy regarding problems that ought to be investigated and for selecting the projects or persons who should receive support.

But medical men, whether they be engaged in teaching or in research or in the practice of one of the many branches of medicine have always been and always will be individualists. Such an outlook is inherent in the calling itself where each man's opinion, however unorthodox, has at least the respect of his colleagues, and it is one of the fundamental reasons why the profession can never present a united front against attack, or a generally agreed policy when such is required. No one of us would have ourselves otherwise, but it does mean that we are easy game for political and other exploitation.

Best himself said of Banting "His chief monument will be in the minds of young men stimulated by his brilliant and fearless career", and it is in this spirit that I terminate my somewhat provocative remarks on certain aspects of University work, knowing that here in Toronto the school, having already achieved so much in teaching and research, cannot do otherwise than go forward to emulate and even surpass the brilliant record of the past.

## Clinical and Laboratory Notes

### CHEMICAL CONFIRMATION OF THE ABUNDANCE OF RETICULIN IN THE LUNG\*

F. BERTALANFFY, M.Sc.,†  
R. E. GLEGG, Ph.D. and  
D. EIDINGER, B.Sc., Montreal

RETICULIN FIBRES have been demonstrated in the lung by means of the silver impregnation method (see reviews of Bargmann,<sup>1</sup> Miller<sup>2</sup> and Hayek<sup>3</sup>) as well as the periodic acid-Schiff technique (Leblond<sup>4</sup>). Leblond and Bertalanffy<sup>5</sup> recognized the fact that this reticular material is

\*From the Department of Anatomy, McGill University, Montreal.  
†J. B. Collip Fellow in Medical Research, McGill University.



organized into sheets referred to as: (1) "surface reticulin membranes", which presumably are the basement membranes of the thin surface epithelium described by Low and Daniels;<sup>6</sup> (2) "internal reticulin membranes" which consist of poorly organized material within the alveolar wall; and (3) "capillary reticulin membranes" wrapped around the endothelial tube on the outside of each capillary.

Recently,<sup>7</sup> as a result of an investigation of reticular fibres from several organs and tissues (lymph nodes, testes, adipose tissue and lungs), reticulin has been re-defined as a carbohydrate-protein complex containing the following monosaccharide components: galactose, glucose, mannose and fucose. The present communication is a special detailed report concerning the lung. The investigation serves as a comparison between the chemical constituents and the histologically visible components and involves the preparation of the framework of the lung of cattle (which includes a large amount of reticular and collagenous material and a moderate amount of elastic fibres) in as cell-free a condition as possible. This framework was hydrolyzed by means of the hydrogen-form of a polystyrene sulfonic acid resin,<sup>7</sup> and analyzed by paper partition chromatography for the identification of monosaccharide components. In addition, the collagen content of this material has been studied.

**Preparation of cell-free "framework material" from lung.**—Blood was removed by forcing large volumes of running water into the pulmonary and bronchial arteries at the hilus of the lung lobes and out through the pulmonary veins, until the lung was white in appearance and the water was clear. Cellular elements of the alveolar tissue as well as mucus were removed by forcing water through the air conducting system via the bronchial opening at the hilus.

The pleura was then stripped off. The lung was sliced to make it possible to locate and excise large blood vessels and bronchi. The remaining tissue was cut into small pieces and stirred with frequent changes of distilled water over a period of one day in a further attempt to remove cells and soluble materials. Chloroform was added to the distilled water to prevent putrefaction.

In order to determine whether the tissue was now cell-free, a small portion was homogenized in distilled water, and a small part of the homogenate allowed to dry on a glass slide. The Feulgen nuclear stain was applied to this smear and showed that the preparation was almost completely free of cells.

The tissue freed from cellular material was then dehydrated with 95% alcohol, defatted with boiling acetone, washed with ether, and dried *in vacuo*. The remnant was referred to as "framework material" of lung.

**Extraction of collagen from the "framework material" of lung.**—Five grams of dried frame-

work material was heated twice for three hours and finally for seven hours with 200 ml. portions of distilled water to extract collagen. The residue was dehydrated with alcohol, washed with acetone then ether and dried. The dry residue weighed 3 gm. Thus the framework material contains approximately 40% of a material extractable with boiling water, which was presumed to be collagen.

**Hydrolysis of the lung framework.**—The hydrolysis was catalyzed by the hydrogen form of a polystyrene sulfonic acid resin, Permutit Q.<sup>7</sup> The resin was pretreated with 4.4N hydrochloric acid (900 ml. of acid per litre of resin), washed with distilled water until the washings were neutral and free from chloride ions, and air-dried. 200 mgm. of the reticular framework, 2.4 gm. of resin and 5 ml. of water were heated in sealed glass tubes in an oven at 100° for 48 hours. The liquid was decanted, the resin washed twice in the tube with 2 ml. portions of water, the solutions combined and filtered. The filtrate was evaporated to dryness *in vacuo* at 40° C. and the residue dissolved in 0.1 ml. water.

**Paper partition chromatographic analysis for monosaccharide components.**—The solution was analyzed by uni-dimensional ascending paper chromatography using a rectangular sheet of Whatman No. 1 paper, 27 cm. wide by 38 cm. high. 3 $\lambda$  of the final solution was placed at a point of origin located on a line drawn at 4 cm. from one of the narrow edges of the paper. For comparison, 3 $\lambda$  of a solution which was 1% with respect to galactose, glucose, mannose, fucose and ribose was also placed on the line as a marker. The paper was fastened in the shape of a cylinder, developed three times<sup>8</sup> in a butanol: pyridine: water solvent,<sup>9</sup> and sprayed with the aniline hydrogen oxalate reagent.<sup>10</sup> Simple sugars and hexuronic acids, but not hexosamines, may be recovered and detected by this method of hydrolysis and chromatography.<sup>7</sup>

The chromatograms showed that the framework material from lung gave rise to intense reddish-brown spots for galactose, glucose and mannose and a less intense greenish-brown spot for fucose. A barely visible spot for ribose was also present—a fact which was taken to indicate that the preparation was nearly free from cellular contamination.

The presence of these sugars has already been shown to be characteristic of the carbohydrate moiety of reticulin.<sup>7</sup> Since only 40% of the reticular framework was extractable with boiling water (collagen), then it can be concluded that as a result of chemical and morphological investigations the supporting framework of the alveolar lung tissue is made up of a large amount of reticulin material.

The presence of carbohydrate in reticulin fibres and membranes explains the staining with the periodic acid-Schiff technique. This method is

(Concluded on page 220)

# The Canadian Medical Association Journal

published monthly by

THE CANADIAN MEDICAL ASSOCIATION

Editor: H. E. MACDERMOT, M.D., F.R.C.P.[C.]

Editorial Offices: 3640 UNIVERSITY ST., MONTREAL

(Information regarding contributions and advertising will be found on the second page following the reading material.)

## Editorials

### OUR AGEING POPULATION

We are learning to recognize a strange paradox in Canada. Our country, so active in growth, so young in development, is witnessing a steady and even rapid ageing of its population. A recent symposium on its public health aspects brings out this phenomenon very clearly.\* We are told that "only 20 years ago we had some 576,000 persons over 65 years of age; the number has now increased to over 1,000,000; and while the total population increased 35% in the last 20 years our aged group has almost doubled. During the last 50 years the number of aged persons has increased four times, while the total population has increased slightly over two and a half times."

It's no use trying to shrug these figures off as "only statistics". There they are; and what's more they are apparently going to demand more of our attention rather than less.

Three factors determine the age composition of a population at any given time—birth and death rates and migration. If the first two remain fixed as well as the age proportions of those moving in and out of the country, then the age structure will be relatively stable. If, however, both the birth and death rates decline the proportion of older aged people will increase, and if the death rates of the younger people decline more quickly than those of the older, the survivors to older ages will increase even more rapidly.

There has been some decline in our birth rate from the high of about 30 per 1,000 to an average of 27.4, but there is a much more dramatic decrease in mortality, especially in infant and

maternal mortality in the past two generations. It has been said that 30% of those reaching 65 owe their survival to advances in medicine generally since they were born.

To these figures must be added the fact that migration has contributed considerably in the years between 1881 and 1931. In that period over 5,800,000 immigrants entered Canada, of whom over 4½ million entered between 1901 and 1931. These people were largely between 20 and 40 years of age and their survivors (excluding even the many who went to the States) will now be in our aged group.

These then are the main factors leading to a preponderance of the aged in the population. Even more striking perhaps is the fact that the most notable increases in the numbers of the aged in the last 20 years have taken place in the Western Provinces. In Manitoba, e.g., the proportion of population over 65 has gone from 4½% in 1931 to 8½% in 1951. The increase is more marked in Saskatchewan, which in the same period has gone from 3.4% of the province's population to 8%. British Columbia which had 38,000 aged in 1931 now has 126,000. The young men who have gone west have become older!

This trend is not only new in our Canadian development, but it has developed comparatively suddenly. To the older countries such as Europe and the East it is familiar and some adjustment to deal with it has been made. We in Canada are relatively unprepared for it. Here and there men have said that geriatrics is going to occupy an increasing proportion of medical practice, but it is evident from the discussion in a symposium such as this one that the magnitude of the problem is not appreciated. The financial, social and mental aspects all are assuming greater urgency. How are we going to deal with them? A point brought out by one speaker was that the very type of living has changed so much in our mechanized age that with all its advantages it has largely done away with many of the things with which older people could occupy themselves: there is the change from rural to urban living, mechanization of farming; smaller housing units; disappearance of home industry; the mobility of population with small family units travelling long distances to work, so that the aged can no longer live "among", even if "with", their children.

These are the social and economic elements of the problem. But they are intimately bound

\*Canadian Journal of Public Health, 44: June, 1953.



up with the health aspect. There are indications for example, that the incidence of senile mental illness varies inversely with the degree of protection against social insecurity. This appears from lower figures of senile psychosis in England and Wales, where non-contributory old age pensions and unemployment have been in force for about 25 years longer than in corresponding American groups. It is well known that many men "go to seed" when they are retired from an active life. As one speaker put it: "There is an old saying that when we cease to strive we die. Unless the retired person has good inner resources he loses his sense of usefulness and feels lonely, unwanted and out of things."

We may indeed expect geriatrics to occupy more and more of the time of the physician. But it is a question which involves much more than medicine alone. The community as a whole, in smaller or larger groups must recognize the problem and seek to meet it before it becomes an emergency, with all its cumulative misery.

---

## Editorial Comments

### POLIOMYELITIS IN WINTER

The November, 1953 number of *The Canadian Journal of Public Health* contains an account of a small outbreak of poliomyelitis which brings out some of the still obscure aspects of the epidemiology of the disease. This outbreak occurred in March, 1952, in the village of Tatamagouche, N.S.: 12 paralytic cases occurred in a population of 628, with one fatality. There was no evidence that it was introduced by any particular "sentinel" case, but there had been a fairly extensive outbreak of polio in the city of Truro, about 40 miles away, in the previous summer and fall. There had also been cases in other parts of Nova Scotia earlier in the same winter, but at points quite far distant, and no known contacts between them and Tatamagouche had been established.

Winter outbreaks of polio are now unfortunately no novelty. Not only may they continue into the cold weather from the summer, but they may begin in the winter as a clearcut fresh epidemic. Well known instances of this are such epidemics as those in the Arctic in 1948-49, in an isolated settlement near the Quebec-Labrador boundary in 1951, and the most recent epidemics in Saskatchewan and Manitoba. It is worth noting also that Prince Edward Island, which is only 25 miles across the Northumberland Straits

from Tatamagouche, had experienced a much higher than usual incidence of polio during the winter of 1950-51. The fact then that the disease may be transmitted during the winter is fairly well established.

In the next place, Tatamagouche experienced a widespread coincident outbreak of what is called a mild type of "polio-like" illness, the symptoms being those of respiratory, gastrointestinal or febrile illness. A number of these appeared a week or so before paralytic cases were recognized, and there was much close contact between the two groups. What is the connection between such minor illnesses and poliomyelitis itself? Are they non-paralytic forms or are they another type of virus disease? It is common knowledge that in the summer months there are often if not epidemics at least many cases of such attacks, often involving only the gastrointestinal tract, with or without fever, violent and usually short-lived. They are spoken of as "summer flu" or grippe, but very little if any investigative work has been done on them. The fact that they recur would be against their being abortive polio as we understand that virus infection, and their rapid onset and limited duration makes their investigation difficult.

This is one of those instances in medicine of the importance of observation in the case of so-called minor disease.

---

### GOING TO BRITAIN IN 1954?

For the past three years the British Medical Association and the Canadian Medical Association have carried out with the concurrence of the Bank of England, a limited exchange of currency plan. Under its terms three British doctors deposit £200 with the British Medical Association and on arrival in this country they are supplied with \$560.

Canadian doctors who desire to assist this exchange may deposit \$560 with the Canadian Medical Association and pick up £200 on arrival in the United Kingdom. We are most grateful to those members of the Canadian Medical Association who have made this exchange possible, since their co-operation has enabled colleagues from overseas to obtain funds for travelling in Canada.

If you have plans to visit the United Kingdom this year and if you will participate in this exchange scheme, please make out your cheque for \$560 to the Canadian Medical Association and send it to the General Secretary at 244 St. George Street, Toronto. When you advise us of your travelling plans, we will arrange with the British Medical Association to turn over £200 to you on arrival.

## FOUNDATION FUND

## COLLEGE OF GENERAL PRACTICE OF CANADA

There will be wide general interest in the knowledge that the long discussed movement to develop a College of General Practice in Canada has now reached a satisfactory stage of organization. The provisional regulations will be found on page 82 of the January issue.

In order to establish the College on a firm foundation, the Organizing Committee are asking for donations in a minimum amount of \$100 each from those who are interested in being Foundation Benefactors of the College.

All donations should be sent to: Dr. Glenn I. Sawyer, Honorary Treasurer, College of General Practice of Canada, 244 St. George Street, Toronto 5, Ont.

## FONDS D'ETABLISSEMENT

COLLÈGE CANADIEN DES MÉDECINS EN  
PRATIQUE GÉNÉRALE

Une nouvelle qui ne manquera pas d'exciter l'intérêt général est celle de l'établissement très prochain d'un Collège de Pratique Générale. On sait que ce projet était à l'étude depuis fort longtemps et enfin on peut annoncer qu'il est en bonne voie de réalisation. Les règlements provisoires apparaissent en page 83 du numéro de janvier.

Afin d'établir le Collège sur des fondations solides, le Comité d'Organisation fait appel aux personnes intéressées à devenir Bienfaiteurs-Fondateurs du Collège et sollicite des dons minimum de \$100.

Tous les dons devront être envoyés à: Dr. Glenn I. Sawyer, Trésorier honoraire, Collège Canadien des Médecins en Pratique Générale, 244 St George Street, Toronto 5, Ont.

## CANADIAN RED CROSS APPEAL

For some years past the Canadian Red Cross Society has made the month of March the time for its annual appeal for funds. This year the appeal is for nearly five and a half million dollars: a large sum, but the minimum with which the far-flung activities of the Society can be carried on.

The work of the Canadian Red Cross reaches into many aspects not only of Canadian life but that of other countries: it is truly international, and is ready to help wherever help is needed. Its widespread organization enables it to put its services into action within hours of disaster, and at all times it carries on ceaseless humanitarian and educational efforts: the constant supply of blood for transfusion; the supply or loan of sick room equipment; the tracing of missing persons; these are some, but not nearly all of the activities of the Canadian Red Cross.

A ready and generous response to this annual appeal is expected.

**Men and Books**THE MONISTIC SYSTEM  
IN MEDICINE\*

S. VAISRUB, M.D., M.R.C.P.(Lond.),  
F.R.C.P.[C], F.A.C.P., Winnipeg, Man.

*"All Diseases are the Effect of One General Cause and May be Removed by One General Remedy".—S. Thomson: The Thomsonian Materia Medica or Botanic Family Physician, 12th ed., Albany 1841, p. 505.†*

SAMUEL THOMSON, who wrote the marginal citation in 1841, was neither a philosopher nor a medical sage, but an outright quack. Nonetheless he succeeded in expressing in one brief sentence a concept and a promise that appealed to millions, namely the concept of monistic pathology and the promise of a monistic therapy. Because of this wide appeal he has been successful in establishing a large following, and founding a "system" and a "movement". In this he was by no means unique, but typical of many others who founded sects of lay medicine (Homeopathy, Christian Science, Naturopathy, Chiropractic, Osteopathy, Nature of Diseases Institute, etc.), and thrived by virtue of the receptiveness of large sections of the public to unitarian concepts and therapies.

It would be a mistake, however, to assume that the quest for monistic concepts was confined to lay medicine only, while "legitimate" medicine stood disdainfully aloof. That this is not so becomes obvious even after a cursory, superficial survey of the history of medicine from ancient demonology to the present enlightened age of "stress", and the "adaptation syndrome". Many bona fide monistic systems will meet the eye at once, while deeper digging will unearth similar trends where they are less evident. A study of these concepts is, thus, a vicarious journey through medical history, and, as such, is followed best in a chronological order and begun with ancient times.

Ancient medicine has its roots in primitive demonology. Man was sick because a demon took possession of his body, and recovered when the devil left it either of his own volition or by expurgation. This was the crude and simple view of disease, hardly a "theory" or "system", yet carrying in itself the implication of a concept of extrinsic causation of disease, a monistic concept with its "scientific" counterpart in the views of the early 19th century, bacteriologists, who regarded disease as an extrinsic microbial invasion with man playing but a passive rôle.

As man became more civilized, his demonological ideas became more refined. Devils were

\*Read before the Section of History of Medicine at the Annual Meeting, Winnipeg, June 18, 1953.

†An 1832 edition of Thomson's book, then entitled *New Guide to Health*, was printed at Hamilton, Ontario, as mentioned by Canniff. A copy is in the Osler Library, Montreal.



replaced by vengeful irate deities who afflicted man with disease as punishment for transgression. This concept became subsequently sublimated in the Hebraic teachings of the old Testament, which viewed disease as an act of God either that of retribution for moral, social or religious sins, or as a test of faith. This monistic concept of disease, having its roots in the soil of the monotheistic religion which nurtured it, thus recognized an acting, immediate cause—God; a teleological or ultimate cause—the goal of man's repentance; and an indirect cause—the behaviour of man as an agent of free will. This view makes no reference to the nature or mechanism of disease, thus differing fundamentally from the approach of Greek physicians and philosophers, who were interested in the mechanics of disease rather than its ultimate meaning.

Since the mechanism of disease is the prime concern of scientific medicine, the theories of Greek physicians assume a great significance. The three dominant schools of Græco-Roman medicine were the humoralist, the methodist and the pneumatist. The Humoralist School (Hippocrates 460-377 B.C., Galen 130-200 A.D.) regarded disease as a dyscrasia, an imbalance of the four bodily humours; blood, phlegm, yellow bile and black bile. This system, which was destined to dominate medical thought for many centuries to come, was essentially quaternary. Yet, as originally expounded by Hippocrates, it was based upon the idea of digestion. Dyscrasia, the imbalance of humours with resulting ill health was viewed as a state primarily dependent on faulty digestion of food. The underlying conception, thus, was monistic. (It is of some interest and significance that the name of this ancient body fluid theory of pathology was subsequently adopted by the exponents of the monistic neo-humoralism of modern times—Rokitansky, Richet, Gallais, Lumière.)

Sharply contrasting with these views were those of the Solidist or Methodist School (Asclepiades, 124 B.C.; Themison, 50 B.C.; Soranus 117 A.D.), which regarded the body as constituted of particles of one kind of solid substance, and disease as disarrangement of these particles, which were either too tight or too loose (*"strictum et laxum"*). This is a more unitarian conception than that of Humoralism, and although somewhat less popular than the latter in its time, and almost completely eclipsed during the Middle Ages, it subsequently enjoyed a brief fling in the eighteenth and nineteenth centuries when it was revamped by Friedrich Hoffman (1660-1742) in his theory of tonic and atonic states, George Brown (1735-1780) in his doctrine of sthenic and asthenic conditions, and Giovanni Rasori (1807) in his system of stimulus and contra-stimulus.

The third school, the Pneumatist (Athenæus, *fl.* 50) elevated the concept of the *pneuma*, or vital air essence, from the rather humble position of a fifth element in the Hippocratic system to that of a super element, an all pervading essence,

"the innate heat", and regarded disease as expansion or contraction of the *pneuma* under the influence of provocative states. This monistic system has exerted a considerable influence on medical thought throughout the centuries, appearing in modified forms under different guises in the various mystical systems of vitalism, animism, etc.

When one leaves the fertile fields of Greek medicine and turns to the arid desert of the Middle Ages in search for monistic concepts in Medicine, one finds the pickings rather meagre. This is in keeping with the general paucity of original ideas of any kind in the medical thinking of the times. Monistic medicine was sterile. Arabian medicine dominated by the teachings of Avicenna (980-1037), was largely an elaboration and amplification of those of Galen. The school of Salerno of the 9th, 10th and 11th centuries, as well as the great medical schools of Paris, Bologna, Padua, Oxford and Cambridge of the 12th, 13th and 14th centuries have similarly added but little to the Galenical doctrines. The theory of the four humours was accepted unquestioningly by those in authority, and medicine was shackled to it until the Renaissance and the rebirth of science.

While the scrutiny of mediæval medicine for monistic concepts of the nature and causation of disease is disappointing, it is somewhat better rewarded in the field of therapy for it is during the Middle Ages that the monistic idea of the elixir of life has originated and flourished. The fascinating notion of an elixir that can cure all ills and confer immortal youth went hand in hand with the idea of transmutation of metals. The elixir of life was conceived as "potable gold" (*aurum potable*) transmuted from baser metals by means of the philosopher's stone. The quest of this "Medicine of Metals", the prime preoccupation of the alchemists, which indirectly led to many discoveries in the field of chemistry and medical therapeutics, captured the imagination of both scholar and charlatan throughout the Middle Ages and the early Renaissance.

With the advent of the Renaissance, there came a veritable flood of theories and speculations. The rising interest in mathematics, physics, mechanics and chemistry gave birth to various "iatro" schools, (*iatromathematical*, *iatrophysical*, *iatrochemical*), whose followers interpreted health and disease in terms of the science they favoured.

Iatrophysicists (Descartes, 1590-1650, Borelli, 1608-1679, Baglivi, 1668-1706, Sanctorius, 1561-1636) found the clue to health and disease in physics and mathematics. Their influence, although not as great as that of the iatrochemist, was felt as late as the 18th century (*e.g.*, George Cheyne, 1671-1743, the Newtonian iatrophysicist of the early 18th century, attributed all nervous disorders to one disorder arising from relaxation of solids, especially nerves, in proportion to liquids).

The iatrochemists (Paracelsus, 1490-1591, Van

Helmont, 1577-1644, Franciscus de le Boe, 1611-1679), believed that all physiological processes are brought about by chemical action, and disease is a disorder of the body chemistry. The early iatrochemists were mystics. Accordingly, their systems were a blend of scientific mechanism and mystic vitalism. Paracelsus believed that the chemical actions of the body were under the command of a spirit, the Archæus and that disease was due to poor control of chemical action by the latter. Van Helmont attached a similar action to "blas" under the control of a mysterious "sensitive soul". The later iatrochemists, however, were not "tainted" by mysticism, and their influence persisted through the ensuing centuries. Walter Harris (1657-1732), a pupil of Sydenham, ascribed most of the diseases of infants to "acid prevailing universally". Rokitsky (1804-1878) evolved a neo-humoralist theory, which ascribed all diseases to abnormal states of blood. Lumière in 1922 suggested that disease is due to precipitation or flocculation of colloids with resulting irritation of nerve endings.

Differ as they may, the monistic systems of the iatrophysicists and iatrochemists have one feature in common, the tendency to fit medicine to the Procrustean bed of one basic science, or rather of one aspect of a basic science. This monistic tendency is by no means confined to the mechanistic theories. Indeed it is even more pronounced in the mystical, vitalistic theories that followed in the wake of the "iatro" schools, as the pendulum swung in the opposite direction. The animist school, founded by George Stahl (1660-1734) taught that there was something above physics and chemistry, a supermechanical "vital force" which was the regulating factor in health and disease. This, of course, was neither the first, nor the last word in mystical philosophy. It is a recurring theme. To quote Mettler:\*

"The life force which Hippocrates called the *impetum faciens* . . . was the *pneuma* of the Alexandrians and Galen, and the 'innate heat' of Aretæus. Harvey called it the *spiritus vitalis*, as had Servetus. For Paracelsus it was the *archæus*, and Van Helmont termed it *blas*. In the next century Gaub and Cullen saw it in the *vis medicatrix naturæ*, and in the nineteenth it was the *élan vital* of Henri Bergson. . . ."

As one departs from the nebulous, marshy realm of mystic vitalism, and enters the somewhat more solid regions of 19th century medicine, one finds the flow of monistic theories continue unabated. True, many of them are more "philosophical", or even "romantic" than "scientific", and the overlay of imagination renders the scientific basis at times almost imperceptible. Yet none are devoid of interest and some are still influencing present day medical thought. The systems of Brown, Rokitsky and Harris, have already been referred to. To these may be added those of John Rollo and Novalis who attributed all diseases to deficiency or excess of oxygen, William Cullen (1712-90), who ascribed all

organic phenomena to nerve force, and all diseases to its disorders, J. T. Baumès, who attributed disease to excess or lack of certain elements, F. J. V. Broussais (1772-1838) who believed in non-specificity and close relationship of all diseases on the basis of "irritation", chiefly that of the gastro-intestinal tract, and Jean Cruveillier (1791-1873), who taught that "phlebitis dominates all pathology". (One is somewhat reluctant to mention in the same breath the none too sublime "doctrine of the infarctus" of Johann Kampf, who attributed most human ills to fæcal impaction).

Nor is twentieth century medicine, more or less divested of philosophical and mystical influences, and more rigidly scientific, by any means devoid of monistic theories. The theory of colloidal equilibrium of Lumière has already been referred to. The concept of focal infection is still well remembered. Less well known is the more recent theory of A. D. Speransky, who in 1945 expounded the view that all diseases are brought about by a primary direct irritation of the central nervous system and the diencephalon. A system, currently in vogue, is that of Hans Selye, who ascribes a multitude of diseases to a non-specific response of the pituitary adrenal axis. This theory, although laying no claim of applicability to all diseases and not excluding specific responses, may be regarded by virtue of its emphasis on non-specificity and wide range of diseases that it embraces as a bona fide monistic system. The various schools of holistic medicine: the theory of constellation (Tendeloo 1920), constitution (Martins 1917), function and psychosomatic medicine (Bergmann 1912), to mention but a few, although not to be regarded as monistic systems, have a discernible monistic bias, inasmuch as they overemphasize one particular aspect of causation of disease.

Theories of disease are reflected in therapy. The former are the flowers, the latter the fruit of the tree of medicine. The effect of a theory of disease on medical therapeutics may indeed be striking. The vogue of clysters, so ably ridiculed by Molière, has received a great deal of its impetus from Kampf's "doctrine of the infarctus". The colonic washes of more recent years, that followed in the wake of the theory of "auto-intoxication" are still remembered. Forty-one and a half million leeches were imported into France in 1833 as a result of the theory of "irritation" of Broussais. The tonsillectomies and dental extractions performed as a result of the doctrine of focal infection (Billings 1912) still remain uncounted and unrecorded by medical history. Monistic systems of pathology thus often lead to monistic therapeutics. The primitive witch doctor exorcising devils by chants and incantations, and the modern physician administering steroid hormones, cortisone and ACTH for all and sundry, both practice monistic therapeutics. Between these two extremes there lies a multitude of universal remedies and cure-alls too numerous to mention. Some were aspirations rather than

\*Mettler, C. C., History of Medicine, Blakiston, p. 472, Philadelphia, 1947.



concrete cures. To these belong the elixir of life of Bacon and Paracelsus, the *therapia sterilizans magna*—the universal serum of Paul Ehrlich. Others were practical every day procedures, phlebotomy, purgation, hydrotherapy, oxygen, etc. Needless to say none were universally successful.

Having thus taken a fleeting glimpse into the history of medicine and briefly reviewed the monistic trend, it is difficult to refrain from reflecting upon its cause, mainspring and significance. Why is the quest for unitarian concepts so persistent? Is it the desire for simplification and escape from pluralistic complexities? Is it the connotation of unity to the religious and mystically minded? Are there analogies to be drawn from religious, philosophical and political thought? Intriguing as the above questions may be to the philosopher, to the medical reader the important question is the more pragmatic one of whether this quest for monism has advanced or retarded the progress of medicine. This again is not easy to answer. The arguments for and against are a part of a wider controversy of whether speculation in general has been beneficial or detrimental to medicine. This controversy dates back to the Hellenic era when empiricists derided the dogmatists for their preoccupation with theories about the nature of disease to the detriment of the practical aspects of curing the sick, while the dogmatists scorned the empiricists for their lack of guiding principles. It continues sporadically through the middle ages with speculation, limited and shorn of its wings by the doctrines of Galen, dominating medical thought, into the modern era with its predominant distrust of the "metaphysical" approach. Yet even though speculation has yielded its supremacy to observation, experiment and research, it still has many adherents, who plead for better appreciation of philosophical concepts and speculative ideas, which in their view, must be behind all fruitful experiment.

It is for these protagonists of speculation that the question of the value of monistic concepts in the history of medicine carries significance. It is up to them to weigh the advantages of thorough and exhaustive study of a subject that comes from intensive concentration on one idea against the drawbacks of a narrow outlook and fanatical intolerance that results from any attempt to bring diverse phenomena within the range of a single simple formula, and having weighed the pros and cons it is up to them to supply the answer. The reader who, perchance, happens to be one of them, will, thus, find the answer left to his own discretion. It will not be found in the pages of this paper, which does not purport to be a critical analysis of synthetic concepts, but a historical review. It is non-committal for it merely strives to present these concepts against their historical perspective, thereby demonstrating perhaps (if it needs demonstrating) that time does not dispose of theories, but merely presents them under different guises.

## MEDICO-LEGAL

### AN ANÆSTHETIC ACCIDENT

T. L. FISHER, M.D.,\* *Ottawa*

IN THE LATTER PART of December, 1950 a nine year old girl was anæsthetized in an anæsthetic room and an endotracheal tube was inserted. During the move to the operating room, where tonsillectomy was to be done, the stage of anæsthesia lightened so that the patient was coughing. Quickly the anæsthetist attached to the endotracheal tube the rubber tubing which he believed to be attached to the air nozzle leading from an ether blow-bottle. The air tap of the anæsthetic bottle was turned on and immediately a spurt of ether came out of a "Y" connector which formed the junction between the rubber tubing and the endotracheal tube. Just as quickly the air was turned off and the endotracheal tube removed.

Nevertheless a considerable volume of ether had reached the patient's lungs; respiration ceased immediately and, very shortly after, heart beat stopped. Artificial respiration was begun and almost immediately the chest was opened and cardiac massage started. Heart beat was restored. Various other applicable measures were instituted but pulmonary oedema developed and continued in spite of treatment even though spontaneous respiration had begun. Over the next twenty-four hours there was some improvement in physical condition in spite of partial collapse of the left lung. Consciousness did not return and two days later the patient died.

An inquest was held and in its verdict the coroner's jury decided that death resulted from an overwhelming dose of liquid ether and did not specifically blame the anæsthetist or the hospital.

The case did not come to court so it was not established who of the hospital staff had connected the ether blow-bottle, nor was there a decision about the relative responsibility of the hospital for connecting the apparatus and the anæsthetist for using it when it must have been wrongly connected.

Finally, it was possible to arrive at a settlement of \$1,700.00 with the parents of the deceased child.

It will be noted that, in this as in some previous anæsthetic cases, the surgeon was not implicated. It is worth emphasis that anæsthesia as a specialty has come of age and that many things related to anæsthetics for which surgeons previously were held responsible are now the sole responsibility of the anæsthetist. Anæsthetists, therefore, must be prepared to accept full responsibility for everything connected with anæsthetics given by them.

\*Secretary-Treasurer, Canadian Medical Protective Association.

## MEDICAL ECONOMICS

GOVERNMENT PLANNING: THE  
FEDERAL-PROVINCIAL HEALTH  
SURVEY REPORTS\*MALCOLM G. TAYLOR, Ph.D., *Toronto*

AS THE RECENT DEBATE in the House of Commons on the address in reply to the Speech from the Throne amply demonstrated, health insurance still remains one of the most controversial and complex questions of public policy before the Canadian people, and this despite a very substantial history of public inquiry and investigation stretching back to 1919. Until 1941 the field was explored only at the provincial level but since then has received increasing consideration in Ottawa, as indicated by the appointment of an Interdepartmental Committee in 1941 and the House of Commons Special Committee in 1943, the proposals for a health insurance program in 1945, and the establishment of the Directorate of Health Insurance Studies in 1946.

These various steps were climaxed in 1948 by the announcement of the Health Survey Grant, as part of the National Health Grants program, for the conducting of health surveys by the provinces. The creation of yet another device for obtaining guidance in health policy was apparently considered necessary because of the constitutional responsibility of the provinces for health insurance, a field in which the federal Government had made known its intention to act, however, as far back as 1943.

Although the provinces had presented their views on health services at the Dominion-Provincial Conference in 1945, there can be little doubt that most of them welcomed the opportunity for self-appraisal and future planning which these new funds made possible. By the end of 1952, all the survey reports had been submitted to the federal Government<sup>1</sup> and, though they vary greatly in content, comprehensiveness, and quality, taken together they constitute an examination of public policy in an area of private and governmental activity in Canada probably not matched by surveys in any other field, excepting, of course, the Rowell-Sirois report on Dominion-provincial relations. In many of the provinces, these reports are likely to serve as blueprints to guide the development of health programs for years to come.

## BACKGROUND AND PURPOSE OF THE GRANT

In 1944, the House of Commons Special Committee on Social Security, besides proposing joint financing of health insurance, recommended that the Government should offer to the provinces a

specific grant for the support of tuberculosis, mental health, and general public health services, but there was no mention at that time of a grant for survey or planning purposes. In 1945, the federal Government made its historic offer to the provinces, incorporating the health insurance program in much broader proposals for social security, public investment, and tax transfers. Included in the health insurance proposal was an entirely new "Planning and Organization Grant", to enable each provincial government to prepare for and organize health insurance benefits. To obtain the grant, the province had to agree to submit a provincial health insurance program within eighteen months.<sup>2</sup> Apparently the provinces objected strongly to the obligation of coming forward with a health insurance program, for at the opening of the Dominion-Provincial Conference in the following November, the Prime Minister announced the removal of the condition:

"It is our intention to appropriate necessary funds at this session of Parliament to provide at January 1, 1946, the planning grants for health insurance and the planning grants for public works as outlined in the Dominion Proposals. . . ." "These are firm commitments which we propose to make without regard to the acceptance of the over-all proposals. . . ."

Despite this assurance, the complete breakdown of the Conference apparently precluded the adoption of any federal proposals and it was not until 1948 that the Government decided to inaugurate certain phases of its health program without reference to agreements in the field of taxation. The Prime Minister announced the proposals, now termed "The National Health Grants Program", on May 14, offering to the provinces ten grants,<sup>3</sup> the first being a non-recurring grant of \$625,000 (raised to \$645,180 with the later grant to Newfoundland) to be known as the Health Survey Grant.<sup>4</sup> Although obviously the

<sup>2</sup> *Proposals of the Government of Canada*, Aug., 1945, 31. The grant was, in a sense, a parallel proposal to the planning grants for implementing public works projects under the Public Investment Proposals.

<sup>3</sup> *H. of C. Debates*, May 14, 1948, p. 3933. The other grants and their amounts were as follows: (a) General Public Health, \$4,395,000; (b) Venereal Disease Control, \$275,000; (c) Mental Health, \$4,000,000; (d) Tuberculosis Control, \$3,000,000; (e) Cancer Control, \$3,500,000; (f) Crippled Children, \$500,000; (g) Professional Training, \$500,000; (h) Public Health Research, \$100,000, to be increased by \$100,000 each year to a maximum of \$500,000; and (i) Hospital Construction Grant, \$13,000,000.

<sup>4</sup> The allocation formula was altered slightly in 1948 by providing that no province should receive less than \$15,000, the effect being to increase the grant to Prince Edward Island from \$9,800 to that amount. Changes in grants to other provinces are the result of using the 1947 intercensal estimates of population in place of the 1941 census figures. The distribution of funds under the two formulas was as follows:

	1945 Formula	1948 Formula
	(in thousands of dollars)	
Newfoundland .....		20.2
Prince Edward Island .....	9.8	15.0
Nova Scotia .....	33.9	33.4
New Brunswick .....	27.9	27.5
Quebec .....	171.6	174.8
Ontario .....	194.4	196.6
Manitoba .....	41.5	39.0
Saskatchewan .....	49.8	43.5
Alberta .....	44.8	42.6
British Columbia .....	45.9	52.7

\*Reprinted by kind permission from *The Canadian Journal of Economics and Political Sciences*, 19: 501, 1953, in which the full bibliography may be found.

<sup>1</sup> With the exception of the Newfoundland Survey which was necessarily begun much later than the others.



direct successor of the 1945 proposed Planning and Organization Grant, the new terms of reference were considerably broader. According to the Prime Minister, the Survey Grant had three purposes: (1) to ensure the most effective use of the other health grants; (2) to plan the extension of hospital accommodation; (3) to plan the proper organization of hospital and medical care insurance.

#### THE SURVEY AGENCIES

With no other direction from Ottawa than that the province "designate an agency" to conduct the survey, the provincial governments were faced with the problem of deciding the type of agency to establish. One obvious choice was to designate the health department or a committee of senior health officials as the agency. Two provinces actually had existing planning and advisory councils to which the task might logically have been assigned. The provincial governments were not alone in their concern with the problem of establishing the survey agency, however, for the Canadian Medical Association, vitally interested in the surveys and accustomed to full consultation on health matters at the federal level,<sup>5</sup> suggested to its provincial divisions that they offer their services in the conduct of the surveys. This the provincial divisions did and their action was followed by similar offers from the hospital and other professional associations in most provinces. These offers raised the question: if the various professional organizations were to be accorded a rôle, should spokesmen for "consumers" be represented? Furthermore, if a representative committee were to be appointed, should it be given responsibility for the actual content of the final report or should it merely act in an advisory capacity to a health department committee, which would take its views into account but not necessarily endorse them?

The provincial governments reached different answers to these questions.<sup>6</sup> British Columbia appointed a departmental committee and though it was later expanded by the addition of representatives of the medical and nursing professions, its report states clearly that it represents "the opinions and proposals of the Department of Health and Welfare" and in no way can be construed as government policy. The British Columbia Medical Association has stated that it assumes no responsibility for the report's recommendations or conclusions.<sup>7</sup>

The Alberta committee was small, with representatives of the health department, the medical profession, hospital association, women's organizations, and the municipal associations. Its find-

ings and recommendations were presented as an independent report to the Government. The Saskatchewan government appointed a health survey committee, consisting of two members from its Health Services Planning Commission, five representatives of professional associations, and five representing the public. Its findings and recommendations were also presented as an independent report to the Minister of Health. Manitoba appointed an advisory health survey committee of twenty-four members, representing the government, the health professions, and the public. The report, largely the work of three major sub-committees, was presented by the main committee to the Government as an independent report.

The Ontario survey committee was the only one which had a full-time chairman appointed from outside the government and for that matter outside of health circles entirely. He presided over a seven-member committee, with three appointees from the government and three from the public. The decision of the Ontario government not to appoint official medical representatives led to criticism by the Ontario Medical Association and an announcement that the Association would conduct an independent survey.<sup>8</sup> Finally, twelve sub-committees were appointed with ten to twenty-five members each. Among the sub-committee members were representatives of organized medicine and consequently the Ontario Medical Association dropped its projected survey.

The Quebec report was prepared under the direction of the Ministry of Health, assisted by a representative advisory committee and nine technical sub-committees corresponding to the other nine federal health grants referred to above.

The New Brunswick committee had five members, two representing the medical association, two representing the Maritime Hospital Services Association (Maritime Blue Cross), and one the Department of Public Health. Eight sub-committees assisted the main committee and, in addition, these had the advice of a parallel series of committees of the New Brunswick Medical Association. If it could be said of the Ontario health survey committee that it lacked medical representation, it might be said of the New Brunswick committee that it lacked public representation. In Nova Scotia, the government established a central committee of ten officials representing the departments of health of the province and the city of Halifax, as well as certain other government departments. To assist this group, an advisory committee of ten members was appointed representing the professional and public associations. In addition, several of these associations, particularly the Medical Society, appointed sub-committees on various aspects of health services. In Prince Edward

<sup>5</sup> A number of the provincial divisions of the Canadian Medical Association already had established such a consultant relationship in their own provinces.

<sup>6</sup> A. D. Kelly, "The National Health Grants: Progress in the West," *Canadian Medical Association Journal*, April, 1949, 405-6.

<sup>7</sup> *Bulletin of the Vancouver Medical Association*, Oct., 1952, 49.

<sup>8</sup> *Ontario Medical Review*, Feb., 1949, 3-4.

Island, the government appointed a health planning commission, broadly representative of the public and the health professions with the Director of the Provincial Laboratory as chairman.<sup>9</sup>

These, then, were the agencies which conducted the provincial surveys. It is obvious that there was genuine concern about the eventual contents of the reports: hence the desire for representation on the responsible committees. There was probably some fear on the part of certain governments that a completely independent report might be too critical of existing programs or of the lack of programs, and the health professions were no doubt worried about the proposals concerning health insurance which might emerge.

It is doubtful whether the types of agencies which actually evolved were what the federal Government had in mind when the grant was made. Since responsibility for health rests with the provinces, the Dominion is necessarily dependent upon their views in planning any joint program in this field. It can be assumed that what Ottawa wanted to hear, therefore, were the views of the provincial governments, not of survey committees whose "representativeness" was sometimes doubtful, nor of permanent health officials unable to commit their governments. If the Survey Grant is considered in the light of the 1948 statement of the Prime Minister that the health grants constituted "the first stages in the development of a comprehensive health insurance plan for all Canada," then it would have been reasonable for the federal Government to expect that the provinces would come forward with specific and responsible proposals of their own. This no provincial government did.

Why did the provinces not devise their own official policies? Their course was undoubtedly influenced by the early representations from the medical and hospital associations which offered their services and in most cases obtained membership on the investigating body. To accept the principle of a representative committee, and then to present that committee's findings and recommendations as the government's report to Ottawa, would have left a provincial government in the position of having its program determined for it by a group over which it had no control. On the other hand, there were advantages in relying on such a body: the professional associations had expert knowledge to offer, their assistance was essential in the survey of facilities and personnel, and their co-operation would ultimately be required in carrying out the plans.

Most of the governments, therefore, apparently decided that it was better on balance to risk disappointing Ottawa. Accordingly, practically every report which was the work of a committee is prefaced by a statement of the minister to the

effect that it is an excellent report, the government has reservations about some of the recommendations, the government obviously lacks the funds to carry all of them into effect, but the health department would do what it could and, indeed, many of the recommendations have already been adopted.

#### THE MAJOR FINDINGS AND RECOMMENDATIONS

The major part of every report is given to an inventory of health personnel, including not merely number of physicians, dentists, nurses, and technicians, but age distribution, qualifications, specialties, and geographic distribution. Several reports made estimates of the extent of need for additional personnel and related these to projections of future supply based on such factors as present age composition, annual output of the present and currently planned educational centres, and national and interprovincial migration. Several reports also recommended the establishment of additional training facilities. Certain reports (notably from the Prairie and Atlantic provinces) recommended joint action among several provincial governments to this end. In all reports the shortage of nurses was stressed and there are many recommendations for studies of nursing functions and for further use of sub-professional personnel.

The cost of medical or other professional education led several committees to recommend subsidies or bursaries to students. Some committees tied this recommendation to the proposal that each recipient of a bursary sign an agreement to practise in rural areas (where shortages are most noticeable) for a minimum of three years following graduation. So seriously did the committee view the shortage of rural health personnel that, without exception, every report recommends subsidies for rural physicians, several mention subsidies for rural dentists, and one even recommends subsidies for rural physicians' wives.<sup>10</sup> Other reports recommend subsidization of small rural hospitals or health centres.

Since, in the administration of the Hospital Construction Grant, the Department of National Health and Welfare required that every hospital construction project submitted "be in accordance with a system of priorities based on the relative need throughout the province for hospitals," the planning of further hospitals occupied a central place in every survey. The pattern followed is a striking example of a co-ordinated plan in a field involving different levels of government and voluntary and religious organizations. Most surveys followed the pattern of planning developed by the Commission on Hospital Care in

<sup>9</sup> A. D. Kelly, "The National Health Grants: Progress in the Maritimes," *Canadian Medical Association Journal*, Feb., 1949, 192-3.

<sup>10</sup> While providing a rather novel approach, this recommendation is based on the realistic observation that probably the greatest single factor dissuading the physician from rural practice (frequently more lucrative than a city practice) is his wife's attitude to local rural social attractions.



the United States which introduced the concept of an integrated "regionalized" hospital system, with hospitals designated as "regional," "district," or "community" according to their special rôle.<sup>11</sup> Priorities of construction, allocation of beds, and development of specialized services were then determined in accordance with the plan.

All reports offered proposals for using the federal grants to extend services for the control of tuberculosis, venereal disease, mental health, and general public health. All stressed the importance of blanketing the province with local public health units; and the emphasis given to health education is noteworthy.

The cancer control grant presented a much more controversial issue, for, unlike mental illness or tuberculosis services which are universally accepted as public health functions, final responsibility for the treatment of cancer has been assumed in Alberta and Saskatchewan only. But the cancer grant was given for the purpose of "diagnosis and treatment" and if provincial governments were to use these funds, they would obviously have to organize and pay for treatment services. The conflict over the boundary between public health and the field of the private medical practitioner is apparent in several reports; and a number adhere to the principle that payment for treatment is the responsibility of the patient unless he is or becomes indigent. For example, one report recommends: "that free treatment of cancer be based upon finances available, hence *not* to include: (a) surgeon's fees for diagnosis by laparotomy or similar surgical procedures; (b) operative and postoperative treatment; (c) medical care; (d) hospitalization, except in a limited way for diagnosis and radiation therapy." And another report succinctly summed up the issue in these words: "that any program to facilitate the diagnosis and treatment of cancer organized by the provincial department of health, or financially assisted by that department, should adhere strictly to the principle that it should not clash headlong with the practice of medicine as it is now carried out within the community."

But it is on the Prime Minister's third point—the "proper organization of hospital and medical care insurance"—that the reports differ most sharply and where, if the federal Government was looking for guidance, its expectations bore little fruit. Only Alberta and Saskatchewan submitted proposals for health insurance substantially in conformity with the federal proposals of 1945. Ontario surveyed the voluntary plans but its report and that of Quebec contain no recommendations on health insurance. The departmental report of British Columbia stressed the need for further study of health insurance but recommended that early consideration be given to such a program for children only.

The reports of the Maritime surveys are not concerned with the principle of adopting health insurance, which they accept, but with the questions of when and under whose direction it should be introduced. On the question of whether demand must precede resources for service, or resources precede demand, New Brunswick and Nova Scotia hold firmly to the latter view.

The New Brunswick report recommends "that the Government delay the development of any general plan of compulsory health insurance until (a) more beds and (b) more nurses and other trained personnel become available." The Nova Scotia report is equally explicit: "It is recommended that no health insurance plan be considered until the facilities and trained personnel are adequate to meet the anticipated volume of services." Yet such shortages are apparently no barrier to the extension of the voluntary plans, for the report suggests that the voluntary health care plans could be extended "to cover the whole population" by the simple device of providing government subsidies either to the services (hospitals, physicians, etc.) or directly to the prepayment plans whose premiums would then be within the reach of "almost all" persons.

On the question of how health insurance should be operated, New Brunswick, Prince Edward Island, and Manitoba recommended that the voluntary hospital and medical care plans be encouraged and extended and that the government should pay the premiums for those unable to pay. The principle and the phraseology appear to have been adapted from the 1949 statement of policy of the Canadian Medical Association:

"The Canadian Medical Association, having approved the adoption of the principle of health insurance, and having seen demonstrated the practical application of this principle in the establishment of voluntary prepaid medical care plans, now proposes: (a) the establishment and/or extension of these plans to cover Canada, (b) the right of every Canadian citizen to insure under these plans, (c) the provision by the State of the health insurance premium, in whole or in part, for those persons who are adjudged to be unable to provide these premiums for themselves."

Of other important recommendations deserving attention, only one group can be considered here, namely, proposals for establishing permanent advisory bodies. The unanimity on this point is surprising: New Brunswick favoured "An Advisory Council . . . of health and welfare representatives"; Quebec proposed "a committee of advisors to assist the Minister . . . and to serve as a bulwark for provincial autonomy in public health matters"; Ontario, "a Hospital Commission"; Alberta, "expansion of the existing Provincial Board of Health"; Nova Scotia, "an Advisory Council"; Saskatchewan, "expansion of the Health Services Planning Commission to include public and professional representatives."

<sup>11</sup> Commission on Hospital Care, *Hospital Care in the United States* (New York, 1944), 349-403.

These proposals indicate that the committees were searching for solutions to the fundamental problems of group representation of affected interests, the necessity for expert advice, and the principle of responsible government. One pattern for such broadening of participation in health services administration was outlined in the Model Health Insurance Act drafted in 1944 by the House of Commons Special Committee on Social Security, which provided for health insurance to be administered by provincial independent commissions, thus taking into account the demands of the medical, hospital, labour, and agricultural spokesmen.<sup>12</sup>

None of the bodies recommended by the health survey committees can be classified as "independent commissions" but they do imply that "producer" and "consumer" views should be readily heard. In this they follow the principle laid down in the British White Paper in 1944: "Nevertheless, the Government recognize that the provision of a health service involves technical issues of the highest importance and that in its administration, both centrally and locally, there is room for special devices to secure that the guidance of the expert is available and does not go unheeded."

#### GENERAL COMMENTS

While this note could not contain an adequate review of the contents of the reports—the hundreds of recommendations for specific improvements in existing services, for experiments in new types of programs, the creation of health units or regions, the rounding out of provincial health administration, better relations with the health professions, closer co-operation with federal health officials, and the citing of scores of problems that need special investigation—enough has been said to suggest the extent of the contribution which the reports make to our knowledge of health services in Canada, the needs which must be met, and directions which future developments should take.

In addition to the importance of their contribution, the health surveys are themselves of interest as devices for appraising demands for public action and seeking the most expeditious ways of achieving goals which may be agreed upon. As an alternative, the federal Government might have appointed a Royal Commission similar to the Commission on the Health Needs of the Nation appointed by President Truman in 1951, or a House of Commons committee might have been set up similar to that which considered old-age security, or the federal Gov-

ernment might have issued a White Paper similar to that issued by the British Government in 1944, or a special federal-provincial conference might have been called, with sufficient advance notice so that provinces might have prepared briefs comparable in content to some of the survey reports.<sup>13</sup> These devices were, however, rejected in favour of purely provincial inquiries; and since the terms of reference accompanying the grants gave no indication of how the inquiries were to be conducted,<sup>14</sup> a medley of procedures was inevitable. Naturally the reports varied with the composition of the agencies which prepared them. The report of a Royal Commission is not likely to be the same as that of a representative committee; the report of a committee without medical representation will not be the same as that without public representation; the report of a departmental official will not be the same as the report of his government; nor, as has been shown, is a report endorsed with reservations by a government the same as a report conveying official government policy.

However, while the reports may not have provided all that Ottawa hoped for, it is certain that in practically every province the surveys had productive results beyond those contemplated, stemming in large part from the participation of many groups. For the first time, in several provinces, government officials, representatives of the health professions, and public representatives joined in the discussion of these problems in a way which probably would not have occurred without external stimulus. Perhaps the clearest indication of positive results in this direction is that in some provinces the periodic discussion and consultation which characterized the work of the survey committees have been continued. The establishment of the practice of community participation in the planning and organizing of services which touch the individual as closely as do those of health will have long-range salutary results probably greater than those emanating from the printed reports themselves. These assuredly compensate for the omission from the reports of official provincial views on what to do with federal grants for health insurance. Such views can undoubtedly be obtained in other ways if and when the need arises.

13 It was the intention of some provinces to present briefs on health services at the Federal-Provincial Conference of 1950 called to consider the old-age security proposals, but the gloomy international, military, and financial picture painted by the three federal cabinet ministers in opening speeches apparently dissuaded them from doing so. Some briefs were well prepared.

14 Health Survey Grant to assist in surveying present health services and facilities including hospitals, and studying ways and means of improving and extending the same." Order in Council, P.C. 3408, July 28, 1948.

12 The views of these spokesmen are set forth in the *Proceedings* of the House of Commons Special Committee on Social Security, 1943, *passim*. The Model Health Insurance Act was not included in the 1945 *Proposals*.



## INCOME TAX INFORMATION

INDIVIDUALS whose income—(a) is derived from carrying on a business or profession (other than farming); (b) is derived from investments; or (c) is more than 25% derived from sources other than salary or wages, are required to pay their estimated tax by quarterly installments during such year. Each payment must be sent in with Installment Remittance Form T. 7-B Individuals. Any balance of tax is payable with interest with the T-1 General return which is due to be filed on or before April 30 of the succeeding year.

Doctors who pay salaries or wages to their own employees and assistants must deduct therefrom such amounts of tax as are prescribed in Tables obtainable from District Income Tax Offices. Amounts so deducted in a month must be sent to the local District Income Tax Office not later than the 15th day of the following month, accompanied by a T.D. 7A Remittance form.

The following timetable indicates the returns required.

A. Doctors NOT receiving salaries amounting to  $\frac{3}{4}$  of income:

Date Due	Forms to be Used
March 31	T.7-B Individuals
April 30	T.1-General (Note: Only doctors deriving their full professional income from salaries may use Form T.1 Short.)
June 30	T.7-B Individuals
September 30	T.7-B Individuals
December 31	T.7-B Individuals

B. Doctors receiving salaries amounting to  $\frac{3}{4}$  or more of income:

Date Due	Forms to be Used
April 30	T.1-General (Note: Doctors deriving their full professional income from salaries may use form T.1 Short.)

Whenever status is changed\* T.D.1.

C. Doctors who pay salaries to their own employees:

Date Due	Forms to be Used
15th of each month	T.D.7A
28th of February	T.4 Summary and Supplementary

### DOMINION INCOME TAX RETURNS BY MEMBERS OF THE MEDICAL PROFESSION

As a matter of guidance to the medical profession and to bring about a greater uniformity in the data to be furnished to the Taxation Division of the Department of National Revenue in the annual Income Tax Returns to be filed, the following matters are set out:

\*With respect to new employer, marital status, dependents.

### INCOME

1. There should be maintained by the doctor an accurate record of income received, both as fees from his profession and by way of investment income. The record should be clear and capable of being readily checked against the return filed. It may be maintained on cards or in books kept for the purpose.

### EXPENSES

2. Under the heading of expenses the following accounts should be maintained and records supported by vouchers kept available for checking purposes:

- (a) Medical, surgical and like supplies;
- (b) Office help, nurse, maid and bookkeeper; laundry and malpractice insurance premiums. (It is to be noted that the Income Tax Act does not allow as a deduction a salary paid by a husband to a wife or vice versa. Such amount, if paid, is to be added back to the income);
- (c) Telephone expenses;
- (d) Assistants' fees; The names and addresses of the assistants to whom fees are paid should be furnished. This information is to be given each year on Income Tax form known as Form T.4, obtainable from your District Income Tax Office;
- (e) Rentals paid; The name and address of the owner (preferably) or agent of the rented premises should be furnished (see (i));
- (f) Postage and stationery;
- (g) Depreciation; A description of the treatment of depreciation may be found on page four of the Income Tax Return form T.1 General under the Part XI Method. The method of computing depreciation for tax purposes is the same as that used last year and you should have no difficulty if you have a copy of last year's return available.

Simply carry forward the balance remaining in each class after deducting last year's allowance. Add to this figure the cost of any new equipment purchased and deduct the proceeds from any disposal of property in each class. The rate you wish to use not exceeding the maximum rate (see below) is applied to this new balance for each class to obtain the depreciation you may claim this year.

The maximum rates for the classes of equipment most used by doctors follow:

<i>Capital item</i>	<i>Annual maximum Class depreciation</i>	
<b>Medical equipment</b>		
(a) Instruments costing over \$50 each and medical apparatus of every type .....	8	20%
(b) Instruments under \$50 each.....	12	100%
Office furniture and equipment.....	8	20%
Motor car.....	10	30%
Building (Residence used both as dwelling and office).....	3	5%

Instruments costing less than \$50.00 each belong in class 12 and have a maximum allowance rate of 100%. They should not be included in expenses but should be recorded as additions in column 3 of the schedule.

Where a doctor practises from a house which he owns and resides in, the allowance may be claimed as above on a portion of the cost of the

residence, excluding land. For example if the residence were a brick building costing \$12,000 and one-third of the space were used for the office, the doctor would use \$4,000 as the business portion of the cost and apply the building rate of 5% to determine the maximum depreciation allowable in the first year.

For further information on the subject you may refer to the Regulations or you may consult your District Income Tax Office.

(h) Automobile expense; (One Car). This account will include cost of license, oil, gasoline, grease, insurance, garage charges and repairs;

The capital cost allowance is restricted to the car used in professional practice and does not apply to cars for personal use.

Only that portion of the total automobile expense incurred in earning the income from the practice may be claimed as an expense and therefore the total expense must be reduced by the portion applicable to your personal use.

The mileage rate permitted in years prior to 1950 may no longer be used to estimate the automobile expenses.

(i) Proportional expenses of doctors practising from their residence: (a) Owned by the doctor: Where a doctor practises from a house which he owns and as well resides in, a proportionate allowance of house expenses will be given for the study, laboratory, office and waiting room space, on the basis that this space bears to the total space of the residence. The charges cover taxes, light, heat, insurance, repairs, capital cost allowance, and interest on mortgage (name and address of mortgagee to be stated); (b) Rented by the doctor: Only the rent and other expenses borne by the doctor such as heat and light will be apportioned inasmuch as the owner takes care of other expenses.

The above allowances will not exceed one-third of the total house expenses or rental unless it can be shown that a greater allowance should be made for professional purposes.

(j) Sundry expenses (not otherwise classified).—The expenses charged to this account should be capable of analysis and supported by records.

Claims for donations paid to charitable organizations will be allowed up to 10% of the net income upon submission of receipts to your Income Tax Office. This is provided for in the Act.

The annual dues paid to governing bodies under which authority to practice is issued and membership association fees, to be recorded on the return, will be admitted as a charge. Initiation fees and the cost of attending postgraduate courses will not be allowed.

(k) Carrying charges: The charges for interest paid on money borrowed against securities pledged as collateral security may only be charged against the income from investments and not against professional income.

(l) Business tax will be allowed as an expense, but Dominion, Provincial or Municipal income tax will not be allowed.

#### CONVENTION EXPENSES

"Effective January 1, 1948, the reasonable expenses incurred by members of the medical profession in attending the following Medical Conventions will be admitted for Income Tax purposes against income from professional fees:

1. One Convention per year of the Canadian Medical Association.

2. One Convention per year of either a Provincial Medical Association or a Provincial Division of the Canadian Medical Association.

3. One Convention per year of a Medical

Society or Association of Specialists in Canada or the United States of America.

The expenses to be allowed must be reasonable and must be properly substantiated; *e.g.*, the taxpayer should show (1) dates of the Convention; (2) the number of days present, with proof of claim supported by a certificate of attendance issued by the organization sponsoring the meetings; (3) the expenses incurred, segregating between (a) transportation expenses, (b) meals and (c) hotel expenses, for which vouchers should be obtained and kept available for inspection.

None of the above expenses will be allowed against income received by way of salary since such deductions are expressly disallowed by statute."

#### PROFESSIONAL MEN UNDER SALARY CONTRACT

The employees' annual contribution to an approved Pension Plan and alimony payments may be deducted from salary income.

Amendments to the Income Tax Act, introduced in 1951 and made retroactive to the beginning of the calendar year 1951, provide for the deduction of certain expenses from salary income.

The allowable expenses include travelling expenses, annual professional membership dues, office rent, salary to an assistant or substitute and supplies consumed directly in the performance of the duties of employment.

The annual registration fee of the Provincial medical licencing authority would be allowable if paid by the doctor himself.

Certain conditions are attached to the allowance of the expenses and without trying to recite the exact provisions of the law the main points are:

(a) That the expenses must have been incurred in the performance of the duties of the office or employment.

(b) That the employee is required, under the contract of employment, to pay the expenses.

(c) To claim travelling expenses the employee must be ordinarily required to carry on the duties of his employment away from his employer's place of business. Travelling between the doctor's home and his office is not included.

Where the travelling expenses are allowable under these provisions, depreciation may be claimed on the automobile used for this purpose but no other claim for depreciation may be made.

#### INCOME FROM A PARTNERSHIP

Additional expenses incurred by a partner, but not charged to the partnership, may be claimed as a deduction from the partner's share of income. However, the partner must be in a position to substantiate these expenses, to show why they were not charged directly to the partnership and that they were necessarily laid out to earn the partnership income.



## Association Notes

### VANCOUVER IN JUNE!!!

The plans for the annual meeting to be held in Vancouver this coming June 14 to 18 are now far advanced. The members of the B.C. Division are trying hard to make it an unusually fine event and are looking forward to a record attendance. You should now be making your plans to attend.

There are to be several novel attractions of both a scientific and entertainment nature, apart from the fact that the meeting is being held in Vancouver—Canada's "Evergreen Playground"—where the snow-capped mountains meet the balmy Pacific.

Dr. G. F. Strong, President-Elect, and Mrs. Strong, have enlisted the whole-hearted support of an able group of colleagues to man the local committees, and it is their ambition to make your visit to the centre of Canada's Evergreen Empire a memorable one.

On the scientific side the most outstanding feature will be two and a half days of coloured television. This unusual contribution is made possible through the courtesy of Messrs. Smith, Kline and French of Montreal. Using this

attractive medium, a wide range of medical and surgical demonstrations and procedures from the Vancouver General Hospital will be shown. The subjects will range widely from such topics as isotope work, obesity, etc., to such mundane items as arterial insufficiency and external version. It will be a quick and pleasant method of obtaining a panoramic view of medical activities in this city.

The latter half of the meeting provides an outstanding "live" program with many distinguished speakers, including Sir Howard Florey, whose work with antibiotics has made such a notable contribution.

Meeting in close relationship to the Canadian Medical Association will be the annual gatherings of the Canadian Academy of Allergy, the Canadian Anaesthetists' Society, the Canadian Society of Obstetricians and Gynaecologists, the Canadian Otolaryngological Society, the Canadian Paediatric Society, the Canadian Neurological Society, the Canadian Rheumatism Association, the Canadian Association of Pathologists and the Canadian Psychiatric Association.

An event of historic importance to Canadian medicine will be the official launching of the College of General Practice of Canada and the installation of its first President.

The Entertainment Committee is looking for something that would be different and that



Lions Gate, Vancouver, B.C.

(Photo by Canadian Pacific Railway)

would help to make your stay in Vancouver more enjoyable, have chartered one of the two largest C.P.R. liners available on this coast for a cruise. The trip will last four and a half hours and will leave the waterfront at 7 p.m. The itinerary will include passage through Burrard Inlet under the famous Lions Gate Bridge in full view of Stanley Park and the North Shore. After sailing through English Bay to the Gulf of Georgia, the ship will penetrate deeply into Howe Sound toward Squamish. This will include cocktails, bingo, dinner and dancing with Dal Richards Orchestra—(this is the orchestra from the Panorama Roof—Hotel Vancouver). Our picture shows the Lions Gate Bridge.

The one bad feature about this cruise is that the number of tickets will be limited to 1,000. The tickets—including cruise, dinner and dancing—will cost \$5.00 each. We would ask that you notify the Housing Committee when making your application whether you would like reservations for the boat cruise also—so that you will not be disappointed. The cruise will be June 17.

A further attraction in Vancouver this summer is the British Empire Games. You may wish to prolong your visit and attend this interesting and historical event.

Housing for the Executive Committee, the members of the General Council and the participants in the scientific program will be handled through the office of the General Secretary and applications will be mailed to members in these classifications. Housing for all other members will be arranged through the Local Committee on Housing and you are referred to the Housing Application Form, published elsewhere in this issue.

Railway identification vouchers, permitting reduced convention rates for members and their families planning to travel to Vancouver by rail, may be obtained from the General Secretary, 244 St. George Street, Toronto 5.

Fun and enjoyment for you and your wife are planned by our hospitable colleagues of the British Columbia Division as the added attraction to a meeting which has everything.

Please register now and a booklet will be mailed to you from our Committee on Information. This excellent booklet will help you in selecting the places and activities, both scientific and otherwise, that you will want to visit or see during your holiday.

Make your plans now to see your friends in Vancouver in June.

## "The Pacific Shore in '54"

C.M.A. CONVENTION - JUNE 14 - 18, 1954

**Make Your Reservation NOW**

### MAIL THIS APPLICATION

To: HOWARD BLACK M.D.,  
CHAIRMAN—HOUSING COMMITTEE,  
ACADEMY OF MEDICINE BLDG.,  
1807 WEST 10th AVE.,  
VANCOUVER, B.C.

Please reserve the following:

MOTEL Single ☐  
Suite ☐  
Kitchen facilities ☐

Motel Price Range \$3 to \$5 per person single  
\$6 to \$15 per family for suite.

HOTEL Single ☐  
Twin ☐  
Double ☐  
Connecting doubles ☐  
Suite ☐

Date of arrival \_\_\_\_\_ A.M.—  
P.M.— Departure \_\_\_\_\_

Are you driving your own car? \_\_\_\_\_

Do you wish a U Drive car reserved? \_\_\_\_\_

Rooms will be occupied by \_\_\_\_\_

Name \_\_\_\_\_ Street address \_\_\_\_\_ City \_\_\_\_\_ Province \_\_\_\_\_

(attach additional names if necessary)

Send Confirmation to Doctor: \_\_\_\_\_ (please print)

Street \_\_\_\_\_  
City \_\_\_\_\_  
Province \_\_\_\_\_



## ADDITIONS TO THE SECRETARIAT

WITH THE GROWTH of our Association there is an urgent necessity for an increase in our administrative staff. It is also necessary to make provision for retirements. We therefore welcome the addition to our staff of Drs. S. S. B. Gilder and A. M. Peart. Dr. Gilder has been appointed co-editor, and Dr. Peart assistant secretary.

Dr. Gilder, a Scot, comes to us after a varied experience. A graduate of London University, he has done hospital and general practice. In 1940 he was taken prisoner in France, and worked in several German hospitals throughout the war, being repatriated in 1944. He was mentioned in dispatches. He then spent five years on the editorial staff of the *British Medical Journal*, and in 1951 was invited to join the secretariat of the World Health Organization in Geneva as medical editor in charge of a Medical Information Unit.

Fluent in French, German and Spanish, and with reading knowledge in several other languages, including Russian, he has numerous translations to his credit, together with many contributions to medical literature.

It need only be added that on a short visit to Canada last October at the time of his appointment by the Executive Committee he made an immediately favourable impression, both with his technical qualifications and his pleasing personality.

Arthur F. W. Peart, M.B.E., M.D., C.M., D.P.H. reported for duty as Assistant Secretary of the Association on January 1, 1954. A graduate of Queen's University in 1940, he served with distinction in the R.C.A.M.C. in Canada and Northwest Europe, attaining the rank of Major and commanding a Mobile Public Health Laboratory and other Hygiene Units. Returning to civilian life, he was appointed Medical Health Officer for Health Region No. 1, Saskatchewan, and in this capacity assisted in the organization of the plan of health insurance which we know as the "Swift Current Experiment". Subsequently he entered general practice in Swift Current. Since 1948, Dr. Peart has been Chief of the Epidemiology Division, Department of National Health and Welfare, where he has gained valuable administrative experience in relation to a variety of medical problems. His appointment to the staff of the Canadian Medical Association is one which will be welcomed by his many friends in the profession, and in the course of his new duties he will become well known to the general membership.

## SPECIAL CORRESPONDENCE

### *The London Letter*

(From our own correspondent)

#### THE HEALTH OF THE NATION

The annual report for 1952 of the chief medical officer of the Ministry of Health provides grounds for sober satisfaction. The most impressive feature of the mortality figures is the fall in the death rate among young women: a relative improvement of 35%, compared with 1950, at ages 15-19, and of 30% at ages 20-24. Most of this improvement is due to the decline in deaths from respiratory tuberculosis, which used to be responsible for about half the total deaths among young women in these age-groups. The total number of deaths from respiratory tuberculosis was 22% less than in 1951 and less than half the number in 1948. The mortality figures for cancer of the lungs are the obverse of these: there were three deaths assigned to cancer of the lung for every two assigned to respiratory tuberculosis. Indeed, cancer of the lung runs cancer of the stomach as a close second for the head of the list of malignant growths in the causes of death—14,218 from the former and 14,409 from the latter.

Coronary disease was responsible for 61,429 deaths, compared with 40,330 in 1948. An interesting observation is that deaths from leukaemia continue to increase—from 1,489 in 1948 to 2,043. Satisfactory features in the mortality tables are: only 32 deaths from diphtheria (2,285 in 1932), 328 deaths from rheumatic fever (1,129 in 1943), and an infant mortality rate of 27.6 per 1,000 related live births, compared with 29.7 in 1951.

The smallpox vaccination position is still far from satisfactory. Compared with 1951, the total number of persons vaccinated was fewer by over 92,000 and the total number of re-vaccinations fewer by 210,000. The "acceptance rate" for infant vaccination was only 30.6%, and not more than 1 in 25 of children entering or leaving school who had been primarily vaccinated in infancy were re-vaccinated.

Food poisoning continued to produce a disgraceful morbidity. The official notifications for the year were 5,872, but it is known that more than 11,000 people had symptoms. *Salmonella* headed the list of presumed causal agents, being responsible for over 2,000 cases. Between 1949 and 1952, processed and made-up meat was responsible for 55 to 60% of all outbreaks in which the vehicle of infection was established.

#### THE LONDON SMOG

Further details concerning the effects of the London smog of December 1952, are contained in the annual report for 1952 of the county medical officer of health of London County Council. What he describes as the "enormous mortality" caused by the smog contributed an extra 0.5 per thousand to the total death rate for the year. During the three days, December 7, 8, and 9, about 440 persons died out of every million living, compared with about 470 persons out of every million living during the worst three days of the London influenza epidemic of 1918.

The interim report of a committee appointed by the Government to investigate the causes and prevention of smog contains palliative measures should there be a recurrence of similar thick fog. Arrangements should be made for the Meteorological Office to issue warnings of areas of normally high pollution in which serious fog is expected to obtain for at least 24 hours. Householders should be encouraged to use smokeless fuel. To reduce smoke, fires should not be banked at night, and rubbish should not be burned. The general public are requested not to bring automobiles into densely populated centres during a serious fog warning. If fog is very thick, elderly people and those suffering from chronic chest and heart conditions are advised to keep indoors and to rest as much as possible. "Those who must go out will find that

a closely fitting simple gauze mask, or a woollen scarf wrapped round the mouth and nose, will give some relief, by filtering out some of the solid contents of "smog".

#### A NEW LINEAR ACCELERATOR

Yet another linear accelerator for x-ray therapy is to be installed in London. This is a 15-million volt one and is to be installed at St. Bartholomew's hospital. The cost is being met by the hospital governors from their endowment funds, with the assistance of a grant from the King Edward's Hospital Fund for London. This potent machine, described as "the most powerful apparatus of its kind in existence for medical purposes", produces highly penetrating rays by the bombardment of platinum by electrons. Its tremendous potentialities can be appreciated from the fact that the recently installed linear accelerator at Hammersmith Hospital is of 8 million volts, whilst the cobalt bomb provides x-rays of 1,300,000 volts.

#### THE WELLCOME RESEARCH LIBRARY

On December 4, with becoming ceremony, Lord Woolton opened the extension to the library of the Royal Society of Medicine which has been made possible by a gift of £125,000 from the Wellcome Trustees. This is an extension which was badly required and will allow the library, the largest medical library in Europe, to house adequately its quarter of a million volumes, and to provide adequate facilities for the 50,000 Fellows who make use of the reading facilities in the library every year. In addition, provincial Fellows borrow 80,000 volumes annually, and it is estimated that the rate of growth of the library is 5,000 volumes a year.

London, January, 1954

WILLIAM A. R. THOMSON

## OBITUARIES

DR. J. N. ANDREW, Manitoba's oldest practising physician, died at Minnedosa on December 21, aged 85. Born at Griswold, Ontario, he came to Manitoba at the age of 7. In his early years he taught school to earn money for his medical training. After graduating from Manitoba Medical School in 1894, he moved to Minnedosa in the following year and practised there continuously. He is survived by a son and two daughters. It was Dr. Andrew's claim that as an intern in the Winnipeg General Hospital he administered the first diphtheria antitoxin in Canada. The 1,000 units had been sent to Dr. A. H. Ferguson of Winnipeg by von Behring.

DR. C. E. COLEMAN of Vancouver, died November 24. He was born in Chatham, N.B., in 1879, graduated from McGill University in 1902 and practiced medicine in New Brunswick and New York State. He moved to Calgary in 1909 where he remained until joining the Royal Canadian Army Medical Corps in 1939. Following his discharge with the rank of captain in 1943, Dr. Coleman began practicing in Vancouver. Ill-health forced his retirement in 1949.

Surviving are his widow, a daughter and a son.

DR. THOMAS MEREDITH JONES, aged 59 years, died in Victoria on November 15. He was born in Victoria, October 15, 1894, and was educated here and in England, served in the medical corps in the First World War under Dr. E. C. Hart of Victoria, at Gallipoli

and Salonika. He later graduated in medicine with honours from McGill, and for several years was on staff at the Mayo Brothers Hospital in Rochester. In 1930 he took up practice in Vancouver, and in 1940 moved to Victoria, largely because of sentimental reasons, for he wished to follow, in the city of his birth, his father's memorable medical path.

In Victoria, he served a term as president of Victoria Medical Society, and was active in affairs of B.C. College of Physicians and Surgeons. As his father before him was a worker for St. Joseph's and Jubilee Hospitals in their formative days, so Dr. Tom worked for these hospitals in their periods of great expansion in recent years. As a lecturer on surgery to nurses-in-training and young doctors he was outstanding.

His hobbies when he could find time away from his patients' rooms, the operating rooms of the hospitals and his busy office, were study of wild life, flowers and dogs. He did much work in the Victoria Dog Obedience Training Club and frequently walked his dogs by the seashore when he lived on Beach Drive.

Dr. Jones leaves his mother in Victoria; his widow and two daughters.

DR. BERNARD W. A. McDOUGALL, Detroit physician, died December 4 in London, Ont., after an extended illness. Dr. McDougall was born in London, and received his education here, graduating from the University of Western Ontario Medical School in 1920. He practised in Parry Sound for a year before opening his practice in Detroit. He was editor of the *Wayne County Medical Journal* in 1940 and 1941. He is survived by his widow.

DR. JOHN E. MCGILLICUDDY, aged 73, died on November 23 in London, Ont. He was born in Warwick Township and graduated from the School of Pharmacy in Toronto in 1902. In 1906 he graduated from the Medical School at Western University. He practised medicine in Exeter for 12 years and in London for 34 years. Dr. McGillicuddy was a member of the Church of St. Andrew Memorial, the Exeter Masonic Lodge, AF and AM, and the UWO Medical School Alumni Association. He is survived by his widow.

DR. JOHN D. MCPHEE died at his home in Port McNichol on December 2. Born in the township of Mara on Lake Simcoe, he received his early education at Orillia and was a graduate of the University of Toronto Medical School. Dr. McPhee was an active member of the Presbyterian Church. He is survived by his widow and an adopted son.

DR. MARTIN JAMES MALONEY died in Ottawa on November 21. Dr. Maloney's death brings to an end a vigorous political and medical career. He practised in true country doctor tradition from Eganville for more than half a century and was a familiar figure to thousands of persons in that district. Born in Wilberforce Township on October 9, 1875, he attended Pembroke High School and studied medicine at McGill University where he graduated with his M.D.C.M. degree in 1897. The same year he set up a practice in Eganville which eventually stretched out to a radius of 70 miles. He travelled by freight train to make many of his distant calls.

Dr. Maloney began his political career in 1911 when he was elected reeve of Eganville. The same year he was an unsuccessful candidate in the federal elections and again in the 1912 by-election when he was narrowly defeated by the Hon. George P. Graham. He was elected in 1925 by defeating the Hon. T. A. Low, Minister of Trade and Commerce in the King government. He successfully defended his seat in the 1926 and 1930 elections. His widow and four sons survive.



DR. EVELYN PATRICIA WILFORD, aged 29, died on December 2 in Chicago, after a brief illness. A brilliant student, she graduated from the University of Toronto in medicine in 1946, having completed the six-year course in four years. She practised for two years in Toronto and embarked on a five-year training program in obstetrics and gynaecology, which she was completing at the time of her death. She was born in China, where her father served for some years as medical missionary. Educated in Toronto, she served in Canada with the R.C.A.M.C. for a short time during World War II. Surviving are her parents, one sister and one brother.

## ABSTRACTS from current literature

### MEDICINE

#### *Treatment of Peptic Ulcer.*

ZETZEL, L.: NEW ENGLAND J. MED., 248: 976, 1015, 1953.

The present status of the treatment of peptic ulcer is reviewed, a disease which affects from 5 to 10% of the male population of the United States and England. While its cause remains unknown it only occurs in the presence of acid gastric juice and it must be considered an incurable disease in the sense that it retains its characteristic tendency to recur in spite of any treatment as yet available. Even radical surgery, if it does not cause complete achlorhydria, may not prevent recurrence. Spontaneous remissions are common. The mainstay of medical treatment is neutralization of gastric acid by antacids and frequent bland feedings and the patient must be made to understand that a modified scheme of such therapy must be constantly maintained. Conservative medical therapy is still the first choice in treatment and, while effective in the acute phase, only 3 to 10% of patients will fail to have a recurrence within two years. Radical surgery, in good hands, will produce good results in 70 to 80% and the operative mortality is probably comparable to that occurring in medically treated patients.

The ideal drug for neutralization of gastric acidity has not yet been found. Calcium carbonate is one of the oldest of the antacid drugs and still among the most effective, its constipating effect can be overcome by the addition of magnesium oxide. The effect of magnesium trisilicate is inconstant. Aluminum hydroxide requires large doses and may cause a secondary rise in acidity. Sodium carboxymethylcellulose is stated to be more effective, acting as a buffer, an anion-exchange substance, providing a protective mucosal coating and acting as a bulk laxative. Mucin, protein hydrolysates, and the anion-exchange resins have proved disappointing. The anticholinergic drugs act to suppress gastric acidity and have some value as therapeutic aids. Atropine, syntropan and traserentine are not satisfactory because of toxicity if used in dosage high enough to produce their pharmacologic effects. Banthine is of more value because its toxicity is less. Hormones have not as yet proved their value despite the clinical knowledge of the comparative infrequency of peptic ulcer in females in the child-bearing period and the beneficial effect of pregnancy in females who do have chronic ulcers. The antihistamines and chlorophyll have likewise been proved ineffective. ACTH and cortisone, despite theoretical considerations pointing to their possible benefit in ulcer therapy, have actually been proved to be not only detrimental but even causative.

Psychogenic factors are of very great importance in the causation and therapy of chronic peptic ulcer but exact relationships are far from clear. The beneficial effects that at first follow almost any newly reported remedy for ulcer are probably largely psychic.

X-ray therapy will lessen gastric acidity, often for prolonged periods. Its effect, however, is unpredictable in any given case. Its use is probably best limited to recurrence of ulcer after radical surgery and in uncontrolled ulcer where physical condition precludes operative interference.

NORMAN S. SKINNER

#### *Limitations in the Use of Gamma Globulin in Poliomyelitis.*

HAMMON, W. M.: AM. J. MED. SC., 226: 125, 1953.

The author, who is Professor of Epidemiology and Microbiology at the University of Pittsburg, refers to the unfortunate effect which the public's emotional attitude has had upon the general use of gamma globulin, indicating that in other epidemic diseases of like low death and disability rates a passive immunization agent of so little practical usefulness would have received much less attention and there would have been less pressure for its use.

Field trial of gamma globulin in the ideal situation of a severe epidemic in its rising phase has returned the probable prevention of one case per 250 to 300 injections whereas as low a ratio of one case prevented per 2,000 injections followed another trial under conditions not as fortunate. Considering this low effectiveness, the wastefulness of mass, indiscriminate, community inoculation is obvious. The administration of gamma globulin to the members of families in which cases occur is suggested as a better alternative. Furthermore, the advantage of protecting families in which cases of suspected and abortive type occur is that the time elapsing between the disease's onset and the appearance of its classical features is not wasted.

G. A. COPPING

#### *Spontaneous Pneumothorax: Medical and Surgical Management.*

DuBOSE, H. M., PRICE, H. J. AND GUILFOIL, P. H.: NEW ENGLAND J. MED., 248: 752, 1953.

A study is presented of 75 patients who experienced 90 episodes of spontaneous pneumothorax. No evidence of active tuberculosis was found in any instance, although two patients subsequently developed this disease (one a later reactivation of an old chronic fibrotic lesion and the other tuberculous meningitis). Recurrent spontaneous pneumothorax occurred in 22 patients (30%) and, because of this fact and because of the frequency of other complications, the authors do not feel that spontaneous pneumothorax should be labelled "benign". The longest time observed between recurrences was thirty months. Complications (other than recurrence) occurred in 31% and consisted of tension pneumothorax, bloody pleural effusion, residual atelectasis and failure of re-expansion of the lung.

Spontaneous pneumothorax is considered to be generally due to the rupture of subpleural blebs. Bullous formations were evident in the roentgenograms of 78% of this series and subpleural blebs were observed in six patients at the time of open thoracotomy and ruptured blebs were found in two.

Bed rest has limited application in treatment, needle aspiration of air is often of value and closed thoracotomy has been shown to be a safe, simple, efficient method of treating a large number of these patients since it reduces greatly the time of re-expansion of the lung. Major thoracic surgery is necessary in patients who have repeated pneumothoraces, in those who develop a bronchopleural fistula, and in cases of failure of re-expansion.

NORMAN S. SKINNER

*Transduodenal Sphincterotomy for Chronic Relapsing Pancreatitis.*

MAJOR, J. W. AND OTTENHEIMER, E. J.: NEW ENGLAND J. MED., 248: 130, 1953.

Chronic relapsing pancreatitis is a common disease and much more common than is generally appreciated. It is almost always associated with chronic gallbladder disease and its symptoms may persist after cholecystectomy and be wrongly interpreted as "post-cholecystectomy syndrome". The condition should always be considered in the differential diagnosis of recurrent attacks of upper abdominal pain and, during the acute phase, an elevated serum amylase is of great diagnostic value. Incision of the Sphincter of Oddi (sphincterotomy) is of great value in preventing the attacks, which are ascribed to reflux of bile into the pancreatic ducts due to failure of relaxation of the sphincter.

The authors report a series of 23 cases of chronic relapsing pancreatitis who were treated by sphincterotomy. Twenty have experienced complete relief, one patient had a single attack the day after the T-tube was removed with no subsequent symptoms, a second patient returned with epigastric pain which was proven due to a newly developed gastric ulcer, and a third case had a single, severe attack three months after operation which was suspected as being due to an over-looked stone in the common duct.

NORMAN S. SKINNER

## SURGERY

*Fifteen-year to Forty-Year Survival Rates Following Radical Mastectomy for Cancer of the Breast.*

HARRINGTON, S. W.: ANN. SURG., 137: 843, 1953.

Studies of material from the Mayo Clinic show that the prognosis in cases of carcinoma of the breast following radical mastectomy depends on several factors. If the axillary lymph nodes are not involved the prognosis is better. The higher the grade of malignancy of the primary lesion on microscopic examination, the less favourable is the prognosis. The older the patient, the better the outlook. Associated pregnancy and lactation or diabetes made the prognosis more serious. But these criteria are of greater value in studying a group than in individual cases for there seems to be a factor of normal tissue resistance to malignant invasion.

There were 4,637 patients operated upon between 1910 through 1934 and 98.4% were traced. All deaths were assumed to be due to malignancy though many were known not to be so. Of the 4,563 patients traced, 1,144 or 25.1% survived 15 years, 17.6% for 20 years, 301 for 25 years, 9.3% for 30 years and 6.9% for 35 to 40 years. Of 300 traced patients who had axillary node metastasis, 6 were living 35 years or more later and of 207 without axillary metastasis 29 lived over 35 years.

There were 116 patients who underwent bilateral radical mastectomy at the Mayo Clinic at different times and 35% lived over 15 years and 24% lived over 20 years. It is difficult to explain the satisfactory results from bilateral non-simultaneous radical mastectomies, especially those who had involved axillary nodes at both operations. It is gratifying to know that carcinoma in the remaining breast is not hopeless.

BURNS PLEWES

*Fibrosis of the Sphincter of Oddi.*

CATTELL, R. B. AND COLCOCK, B. P.: ANN. SURG., 137: 797, 1953.

One of the common causes of unsatisfactory results following cholecystectomy for cholelithiasis is fibrosis of the sphincter of Oddi. Repeated operations for common duct stones may be caused by this lesion.

At the Lahey Clinic nearly half the patients operated upon for cholelithiasis have the common duct explored and in 20% stones are found. If fibrosis of the sphincter can be demonstrated then, further operations can be prevented. Forcible dilatation of the sphincter to a diameter less than that of the common duct does not lead to scarring, but an indwelling long-armed T-tube should be left in for months. A group of 49 patients were studied and of these 32 had had previous cholecystectomies without relief of symptoms. Many had fibrosis of the sphincter without dilatation of the common duct or jaundice. In 35 patients the sphincter was forcibly dilated and in 10 a transduodenal sphincterotomy was done. Twenty-eight out of 37 cases followed more than 6 months were completely relieved.

BURNS PLEWES

*Routine Cholangiography at Operations for Gall Stones.*

ACTA CHIR. SCAND., 103: 3, 1952.

Cholangiographic examination during operation was originally described by Mirizzi in 1930. The method is now widely employed in Scandinavia, where most surgeons endorse its value in modern biliary surgery. This, however, is not the case in England, United States or Canada, and at the Mayo Clinic, for example, operative cholangiography is done only in the event of special indications. The study was based on 700 hundred consecutive operations for gall stones done during the period June, 1947 to June, 1950.

At operation the needle is introduced into the cystic duct near the gall bladder and opaque media is injected. Apnoea is necessary to obtain satisfactory films which are developed in a room adjoining the operating theatre and are examined immediately by the roentgenologist and by the operator.

Stones in the common bile duct and in the hepatic system were found many times when they were unsuspected by the surgeon. The author concludes that cholangiography should be done at all operations for gall stones and that the application of the method is probably not contraindicated by any co-existent cholecystitis, cholangitis or pancreatitis.

CHARLES E. VAUGHAN

## OBSTETRICS AND GYNÆCOLOGY

*Turner's Syndrome in the Female.*

JACKSON, W. P. U. AND SOUGIN-MIBASHAN, R.: BRIT. M. J., 2: 371, 1953.

All congenital hypogonadism is not of pituitary origin. The syndrome of primary ovarian aplasia is described, starting with a brief account of the history of the recognition of this condition. Turner in 1938 first remarked the peculiar combination of webbed neck, short stature, and female infantilism. The important features of the condition are considered, and these are so characteristic as to present an unmistakable and readily diagnosable picture, plainly distinct from primary hypopituitarism, cretinism, eunuchoidism, or any other clinical state. Final proof of diagnosis is to be sought in the urinary gonadotropin level and the laparotomy finding of lack of ovarian tissue, but these are really unnecessary embellishments of a castiron clinical diagnosis.

Two illustrative cases are described, both with high urinary F.S.H. A third case is presented and although the patient is only 10 years old, the diagnosis appears to be inevitable.

The curious conglomeration of congenital anomalies in the clinical picture is discussed.

ROSS MITCHELL



*Cervical Carcinoma in situ: Difficulties in Differential Diagnosis.*

HOFFMAN, J., FARRELL, D. M. AND HAHN, G.:  
AM. J. OBST. AND GYNEC., 66: 354, 1953.

The *in situ* problem is likely to continue to plague the harried gynaecologist for some time to come. Much has yet to be done before the mystery of carcinomatous transformation is penetrated. Until this is accomplished, it is of the utmost importance that we recognize the limitations of our knowledge and adopt a cautious and critical attitude toward any evidence that may be presented.

The findings among more than 8,000 cervical biopsy specimens certainly seem to support the conservative point of view, which maintains that true intraepithelial carcinoma is an exceptional finding under the most favourable circumstances, with the limited diagnostic facilities at our disposal today. It is earnestly to be hoped that future research will eventually enable us to recognize beginning cervical carcinoma with certainty and distinguish it with ease from the benign carcinomimetic lesions which are responsible for the confused state of our thinking today.

ROSS MITCHELL

*Continuous Intravenous Infusion of Demerol in Labor.*

GARCIA, C. R., WALTMAN, R. AND LUBIN, S.:  
AM. J. OBST. AND GYNEC., 66: 312, 1953.

A simple method for the administration of Demerol intravenously is presented. The amounts of medication are relatively small and result in a satisfactory maternal analgesic effect. The infants are not depressed upon delivery. Further investigation is now in progress utilizing alcohol and scopolamine to enhance the analgesic effects of Demerol and to provide amnesia as well.

ROSS MITCHELL

*Endometriosis.*

MEIGS, J. V.: OBST. AND GYNEC., 2: 46, 1953.

Prophylaxis by early marriage and childbearing is a part of the conservative treatment of endometriosis. Preservation of ovarian tissue is important in the treatment of all endometriosis cases, except those past the menopause. Conservative surgery to preserve childbearing is essential in all patients who wish to have children.

Three series of private and ward patients are presented in tabular form. There has been very little change in the three series. In one series of private cases, 25.9% of patients had children following conservative surgery. Further follow-up has raised the number in Private series I and II to 32.4%. A total of 6.9% of the patients in this series had a recurrence or persistence of their endometriosis.

A group of patients with endometriosis in the vaginal apex following total hysterectomy is reported. Medical treatment can be used, but surgical treatment is more satisfactory.

ROSS MITCHELL

**PÆDIATRICS**

*The Newer Drugs and their Indications in Childhood.*

CRUMP, E. P.: POST-GRAD. MED., 13: 552, 1953.

The general practitioner (who cares for some 85% of all paediatric cases), when faced with infection in a child, is justified in initially using combined therapy (penicillin-sulfonamide, penicillin-streptomycin, etc.) until the sensitivity of the pathogen has been established. Clinical response will guide the doctor in many instances, although simple testing for *in vitro* sensitivity is possible.

Aureomycin and terramycin are active against both Gram-positive and Gram-negative bacteria, as well as rickettsiae, spirochaetes, and certain of the larger viruses. They can be used interchangeably in many diseases, although they should not be combined with penicillin. Both have a low toxicity, and such reactions as do occur may be checked by the ingestion of milk or soda bicarbonate following each dose. Both drugs reduce the severity of symptoms in pertussis. Chloramphenicol, because of recent reports of fatal aplastic anaemia following its administration, should be temporarily shelved until its exact rôle in the cause of the anaemia is determined.

The effectiveness of penicillin is cited: against recurrences of rheumatic fever its value in quickly clearing the throat of pathogens in scarlet fever and diphtheria (in both the disease and carrier states); and the value of local therapy in pyogenic infections. In the use of sulfonamide therapy, the author states that sulfadiazine is the drug of choice but admonishes the physician to use care in its administration to infants—especially during the newborn period.

Along with many of the newer drugs, the antihistaminics, ACTH, and cortisone are disappointing as curative agents, but compensate largely through the symptomatic relief which they afford the young patient.

ISABEL M. LAUDER

*Variation in the Proteolytic Activity of Children's Stools.*

EMERY, J. L.: ARCH. DIS. CHILDHOOD, 27: 257, 1952.

A survey was made of the variation in tryptic activity in meconium from 100 newborn infants and in the stools of 100 infants and children from admissions to general hospitals and routine examinations of children. The tryptic content of meconium appeared to be less than in later childhood. Weaned children had the same mean level of tryptic activity as unweaned children, but showed a greater variation in titre. About 1 in 10 of older children has minimal or no tryptic activity in the stools. No relationship was found between the tryptic activity of the stools and the consistency, pH, the presence of undigested muscle fibres in the stools, the height, weight, or general nutrition of the children. An increased incidence of trypsin-low stools was found in cases with disorders of the alimentary tract. No increase was seen in children with respiratory infections, cardiovascular disease, or nephritis. The finding of trypsin-free stools appears to have a higher clinical significance in younger than in older children.

J. A. STEWART DORRANCE

**ORTHOPÆDICS**

*Problems in Fitting and Alignment of Below the Knee Prosthesis.*

VON WERSSOWETZ, O. F., PAINTER, C. W. AND WRIGHT, D. W.: ARCH. PHYS. MED. AND REHAB., 34: 345, 1953.

These people have suggested that re-evaluation be placed on the fitting of B/K prostheses and they cite the common problems encountered with present day B/K prostheses such as pain due to prosthetic fitting and particularly due to the shape of the socket and they advise (1) that care be taken to avoid pressure on the peroneal nerve and the vascular parts of the stump. (2) Restricted dorsi flexion of the artificial ankle joint may interfere with an individual cadence of gait, and an interesting observation by them was a gait cadence of B/K amputees of 60 to 80 steps per minute compared to 90 in the normal, and a military cadence of 120 steps per minute. (3) Low back pain caused by a short prosthesis or by lack of inattention to the equinus placement

of the foot piece in relation to the lumbar curve and the alignment of body weight. (4) Medial stump pain is often due to malalignment of the thigh corset with lack of appreciation of the normal genu valgum. (5) Improper positioning of the knee hinges with the tendency of the stump riding out the socket during flexion. (6) Lateral stump pain may be due to upward slippage of the head of the fibula.

In conclusion, it was felt that the psychological make-up of the patient; the physiologic properties of the stump; and the correct fit and alignment of the prosthesis; along with the practice and training in its use were dependent for success in rehabilitation. It is further suggested that the major problem of pain and muscle atrophy of the thigh could be overcome by ischial weight-bearing thigh corsets.

J. R. FOWLER

## THERAPEUTICS

### *Penicillin Reactions: Their Nature, Growing Importance, Recognition, Management and Prevention.*

KERN, R. A. AND WIMBERLEY, N. A. JR.: AM. J. M. SC., 226: 357, 1953.

The advent of penicillin in 1943 was hailed not only because of its remarkable therapeutic effects but also because of the infrequent and trifling reactions that followed its use. Today penicillin heads the list of therapeutic agents in the frequency, diversity, and severity of the sensitivities which it induces. At present it has replaced sera as the commonest cause of fatal anaphylactic shock.

There is a growing need for the prevention of unnecessary sensitization. Antihistaminic drugs are useless in preventing, minimizing, or treating the severer reactions to penicillin. These reactions may occur in a great variety: Dermatitis medicamentosa, urticaria, lesions like those of erythema nodosum and erythema multiforme, contact dermatitis, exfoliative dermatitis, bullous dermatitis, serum sickness like reactions, purpuric reactions, agranulocytosis, photosensitivity, lupus erythematosus disseminatus, and miscellaneous manifestations such as, convulsions, and cerebral symptoms, liver damage without jaundice, peripheral neuritis, albumuria, etc.

Factors which favour sensitization to penicillin are: (1) Sensitizing exposure. The majority of patients who suffer any type of penicillin reaction, give a history of previous administration of the drug. (2) Allergic constitution. Among 17 fatal cases of anaphylactic shock, 5 were asthmatic. Several more among the fatal cases which have been reported may have had eczema, or allergic rhinitis, as part of their allergic nature. Since 15% of the population are thought to be of allergic constitution, it follows that one in every 7 patients given penicillin is a candidate for eventual penicillin sensitivity. (3) Penicillin preparation and route of administration. It is known that any penicillin preparation, and any mode of administration, can precipitate a reaction in a sensitized person. Oral administration is probably less productive of sensitivity than is parenteral administration. Local applications, may produce considerable local sensitivity. (4) Cross reactions with other fungi. Sensitivity to related moulds may be responsible for a cross sensitivity to penicillin.

It is of paramount importance to recognize the presence of penicillin sensitivity. A history of personal or familial allergy should be taken in every patient before penicillin is administered. Every patient should be asked about previous administration of penicillin and about any reactions which may have resulted. All patients who have previously received penicillin, and who give a personal or familial history of allergy, or a history of any reactions to previous administration of penicillin, should be subjected to a cutaneous (scratch) test with penicillin. Patients who give a negative cutaneous test may nevertheless be highly sensitive to penicillin.

B. L. FRANK

## PUBLIC HEALTH

### *Post-inoculation Poliomyelitis.*

GRANT, J. B.: BRIT. M. J., 4827: 66, 1953.

The Medical Officer of Health at Gatehouse, in the Tyneside district, has another experience to add to those of the London and Melbourne epidemics. Because of these experiences the chief medical officer of the Ministry of Health (1952) advised that in any area in which polio is exceptionally prevalent inoculation with diphtheria and pertussis antigens should be suspended for a time. He stresses the fact that the private practitioner should lose no time in reporting cases or suspected cases of polio to the health department so that all physicians can be informed immediately. Thus, no time can be lost in following the Ministry's advice.

The statistics gathered are significant enough to warrant serious consideration. Of the estimated 3,097 children between the ages of 6 months and 2 years (in the Gatehouse area), 11% had received inoculations during April, May and early June of 1952. In this group, the attack rate was 1 in 118 as against 1 in 305 in the non-inoculated group. When paralysis occurred in the inoculated group it was often found to be present in the limb in which the intramuscular injection had been made—most often the left arm. In the non-inoculated group this was not the case—the legs were most often paralyzed.

The author states that before and during the epidemic in 1947 few such observations had been made. However, in 1949, and subsequent epidemics, it became increasingly apparent that some correlation existed between the inoculations and the polio. He attributes the cause to the wide use of the multiple antigen, and even the use of the pertussin antigen alone seems to have some bearing. The explanation is that the injury to a muscle by the injection is sufficient enough to allow the polio virus, if present, to attack the spinal cord. It is advised that the injection be given in the buttocks since there seems to be a relation to the amount of whole muscle damaged. A larger muscle cuts down the risk. A plea is made for the perfection of subcutaneous antigens since the risk is extremely minimal with this type of inoculation.

ISABEL M. LAUDER

## INDUSTRIAL MEDICINE

### *Occupational Potentialities of the Older Cardiac Patient.*

BRONSTEIN, L. H., GOLDWATER, L. J. AND KRESKY, B.: GERIATRICS, 8: 252, 1953.

That many cardiacs in the sixth and seventh decades can enter into and remain in useful employment, is indicated by the analysis presented in this article. It shows also that continuing employment does not appear to have any adverse effects on the course of heart disease. By means of clinical records supplemented by personal interviews the authors have focused attention on the occupational potential and the specific problems of individuals who are 55 years of age or over at the time heart disease develops. The records used were those of 580 patients who attended the adult cardiac clinics at Bellevue and Lenox Hill Hospitals in New York City during the year 1949. Of this group 304 were 55 years and older in 1949, 236 of them being over 55 when symptoms of heart disease first occurred. Of these 236 the majority were engaged in housework at home or employed as domestic workers and unskilled labourers.

In the group 55 years of age and over, cardiac capacity was diminished to a greater extent than in any other age group; nevertheless 53% of the patients over 55 were classified II C or better. Of these patients over 55, 36% were working full-time and 21% were working part-time. Of more significance was their past work experience; the proportion who continued working after heart disease was diagnosed had decreased with increasing age.



The cardiac capacity was superior among the group who continued working. Nevertheless, 51 patients (36% of the working group) with an initial functional capacity of III (marked limitation of ordinary activity) had worked the greater part of the time since the discovery of heart disease.

With reference to employment, this study indicates the significant rôles of both the physician and the placement agency. The physician assesses the occupational potentialities and limitations of the patient in terms that will serve as a guide for the vocational counselor, while the agency accomplishes results by providing a sufficient number of trained personnel and the time to cope with problems of the older individual with heart disease. In the author's opinion, age, functional, and therapeutic classifications should not be an arbitrary barrier.

MARGARET H. WILTON

#### *Age and Industrial Accident Rates.*

KING, H. F. AND SPEAKMAN, D.: BRIT. J. INDUST. MED., 10: 51, 1953.

That many factors influence accident rates, their effect varying with circumstances, is the belief held by the authors. In this article they review and discuss the methods and the results of certain investigations into the relation of age and industrial accident rates, as reported in literature since the early part of the century. If their contentions are correct, the picture presented is that of two opposing tendencies: on the one hand, the effect of experience, greater carefulness and so on, becoming more pronounced with age and so tending towards a lower accident rate among the older workers; on the other hand, the biological decline of the organism as age advances.

The current view that the accident rate declines steadily as age advances, originated in the work of E. M. Newbold (1926) and some later investigators; other studies contradict this view. The authors present these reports in detail and attempt to show that at least some of the differences of interpretation appear to be due to the methods of recording used, or to the type of work studied. They believe that if data were suitably collected, some of the anomalies could be explained. As a prerequisite of further progress they suggest a detailed approach, taking into account differences in the age-distribution of workers on different jobs, the effects of selection, the work history and experience of individuals, standards of reporting, and the types and degree of hazard of the work. Attention is drawn also to the influence of experience and of general physical and physiological conditions. After discussing the various findings as presented by the investigations reported, the authors conclude that the data at present available have serious limitations and do not permit definite conclusions as to the nature of the relationship between age and industrial accident rates.

MARGARET H. WILTON

#### *Mortality in Relation to the Physical Activity of Work . . . A Preliminary Note on Experience in Middle Age.*

MORRIS, J. N. AND HEADY, J. A.: BRIT. J. INDUST. MED., 10: 245, 1953.

Recent studies of the epidemiology of coronary heart disease led to the suggestion that deaths from this condition in middle age may be less common among men engaged in physically active work than among those in "sedentary" jobs. In testing this hypothesis the skilled, semi-skilled and unskilled workers in the Registrar General's Occupational Mortality Supplement for 1930-32 were classified into "heavy", "intermediate and doubtful" and "light" in terms of the physical activity involved in the jobs. Analysis was made of the mortality data. It was found that the mortality from coronary heart disease at

45 to 64 years of age among the heavy workers was rather less than half that of the light workers.

Using the same material—the mortality data 1930-32—the authors present a preliminary report on the experience of these groups of workers in respect of other causes of death. The focus is on middle age, taken as 45 to 64 years. Considerable detail is given; a series of tables show the comparisons statistically. Seven conditions were isolated in which there was greater mortality among middle-aged men engaged in light jobs than heavy ones, and in which this excess did not appear to be primarily or only a result of the transfer of men from heavy work to light on account of the diseases concerned. These conditions are coronary heart disease, cancer of the lung, appendicitis, diseases of the prostate, duodenal ulcer, diabetes and cirrhosis of the liver. The only condition in which there was a clear tendency for mortality to be greater among the heavy workers was that for fatal accidents. The highest fatal accident rate was that for fatal accidents. The highest fatal accident rate was that for underground coal miners and they were all classed as heavy workers.

Attention is drawn to the fact that among these seven conditions are several "diseases of civilization"—diseases which are of increasing importance as health problems. None of these conditions are particularly associated with poverty, and all show higher mortality in the upper social classes or no variation of mortality between the social classes. That there may be a "general factor" of health and disease associated with physical effort and sedentariness in work is considered. Physical work may be "a way of life" conducive to good health.

The authors indicate also the problems of isolating occupational results of disease (such as the changing of jobs because of ill health) from occupational causes; environmental factors from constitutional factors; and the physical components from the unknown psychological, and the multiple social, components of work.

MARGARET H. WILTON

## FORTHCOMING MEETINGS

### CANADA

ONTARIO MEDICAL ASSOCIATION, Annual Meeting, Royal York Hotel, Toronto, Ont. (Dr. Glenn Sawyer, 244 St. George Street, Toronto 5, Ont.) May 10-14, 1954.

INTERNATIONAL CONGRESS OF PSYCHOLOGY, Montreal, Que. (Prof. H. S. Langfeld, International Union of Scientific Psychology, Eno Hall, Princeton University, Princeton, N.J.) June 7-12, 1954.

SOCIETY OF OBSTETRICIANS AND GYNÆCOLOGISTS OF CANADA, Annual Meeting, Harrison Hot Springs Hotel, Harrison Hot Springs, B.C. (Dr. R. B. Meiklejohn, Secretary, Suite 334, Toronto Western Hospital, Toronto, Ont.) June 10-13, 1954.

CANADIAN MEDICAL ASSOCIATION, Annual Meeting, Vancouver, B.C. (Dr. T. C. Routley, General-Secretary, 244 St. George Street, Toronto 5, Ont.) June 14-18, 1954.

INTERNATIONAL CONFERENCE ON GROUP PSYCHOTHERAPY, Toronto, Ont. (Dr. Wilfred C. Hulse, Chairman, International Committee on Group Psychotherapy, 110 West 96th Street, New York 25, N.Y.) August 12-19, 1954.

INTERNATIONAL CONGRESS ON CHILD PSYCHIATRY, University of Toronto, Toronto, Ont. (Miss Helen Speyer, Executive Officer, International Association for Child Psychiatry, 1790 Broadway, New York 19, N.Y.) August 13-14, 1954.

INTERNATIONAL CONGRESS ON MENTAL HEALTH, Fifth Congress, University of Toronto, Toronto, Ont. (The Executive Officer, Fifth International Congress on Mental Health, 111 St. George Street, Toronto, Ont.) August 14-21, 1954.

INTERNATIONAL CONGRESS OF OPHTHALMOLOGY, 17th Congress, Montreal, Que. (Dr. G. Stuart Ramsey, Associate Secretary, Physical Sciences Centre, McGill University, Montreal 2, Que.) September 9-11, 1954.

INDUSTRIAL MEDICAL ASSOCIATION OF THE PROVINCE OF QUEBEC, AND THE INDUSTRIAL SECTION OF THE ONTARIO MEDICAL ASSOCIATION, Joint Meeting, Chateau Laurier, Ottawa, Ontario. (Dr. W. F. Prendergast, Secretary of the Section of Industrial Medicine, 22 Commercial Road, Leaside, Toronto 17, Ont.) September 23-25, 1954.

#### UNITED STATES

CONFERENCE OF CATHOLIC SCHOOLS OF NURSING, 7th Annual Meeting, Atlantic City, N.J. (Executive Office, 1438 South Grand Blvd., St. Louis 4, Mo.) May 15-16, 1954.

CATHOLIC HOSPITAL ASSOCIATION, 39th Annual Convention, Atlantic City, N.J. (Executive Office, 1438 South Grand Blvd., St. Louis 4, Mo.) May 17-20, 1954.

AMERICAN TRUDEAU SOCIETY, Medical Section of the National Tuberculosis Association, Annual Meeting, Atlantic City, N.J. (Chairman of the Medical Sessions Committee, American Trudeau Society, 1790 Broadway, New York 19, N.Y.) May 17-21, 1954.

AMERICAN UROLOGICAL ASSOCIATION, Annual Meeting, Waldorf-Astoria Hotel, New York, N.Y. (Dr. William P. Didusch, Executive Secretary, 1120 N. Charles Street, Baltimore 1, Md.) May 31-June 3, 1954.

AMERICAN GERIATRICS SOCIETY, 11th Annual Meeting, Fairmont Hotel, San Francisco, Calif. (Dr. W. O. Thompson, President, 700 North Michigan Ave., Chicago 11, Ill.) June 17-19, 1954.

AMERICAN COLLEGE OF CHEST PHYSICIANS, 20th Annual Meeting, San Francisco, Calif. (Dr. Edgar Mayer, Chairman of the Committee on Scientific Program, 850 Fifth Avenue, New York 21, N.Y.) June 17-20, 1954.

AMERICAN MEDICAL ASSOCIATION, Annual Meeting, San Francisco, Calif. (Dr. George F. Lull, 535 North Dearborn Street, Chicago 10, Ill.) June 21-25, 1954.

INTERNATIONAL CONGRESS OF OPHTHALMOLOGY, 17th Congress, New York, N.Y. (Dr. William L. Benedict, Secretary-General, 100 First Avenue Building, Rochester, Minn.) September 12-17, 1954.

INTERNATIONAL ANÆSTHESIA RESEARCH SOCIETY, 29th Annual Congress, Ambassador Hotel, Los Angeles, Calif. (Dr. T. H. Seldon, Chairman, 102-110 Second Avenue, S.W., Rochester, Minn.) October 4-7, 1954.

#### OTHER COUNTRIES

INTERNATIONAL CONGRESS OF INTERNATIONAL COLLEGE OF SURGEONS, Sao Paulo, Brazil. (Dr. Max Thorek, Secretary-General, 1516 Lake Shore Drive, Chicago, Ill.) April 26-May 2, 1954.

INTERNATIONAL GERONTOLOGICAL CONGRESS, London and Oxford, England. (Prof. R. E. Tunbridge, President, General Infirmary, Department of Medicine, The University, Leeds, England) July 12-22, 1954.

INTERNATIONAL CONGRESS ON THROMBOSIS AND EMBOLISM, BASLE, SWITZERLAND. (Dr. W. Merz, Hon. Secretary, Chief Medical Officer, Gynaecological Clinic, University of Basle, Switzerland) July 15-19, 1954.

INTERNATIONAL CONGRESS FOR PSYCHOTHERAPY, Zürich, Switzerland. (Dr. H. K. Fierz, Secretary General, Theaterstrasse 12, Zürich 1, Switzerland) July 21-24, 1954.

INTERNATIONAL CANCER CONGRESS, Sao Paulo, Brazil. (Prof. A. Prudente, 171 rua Benjamin Constante, Sao Paulo, Brazil) July 23-29, 1954.

INTERNATIONAL CONGRESS ON OBSTETRICS AND GYNÆCOLOGY, Geneva, Switzerland. (Dr. H. de Watteville, President, Maternité Hôpital Cantonal, Geneva, Switzerland) July 26-31, 1954.

(Continued from page 197)

based on the oxidation of 1,2-glycol and  $\alpha$ -amino alcohol groups by periodic acid to yield aldehyde groups which then give a violet colour with the Schiff reagent. The monosaccharides identified would provide the necessary functional groups.

#### SUMMARY

A chemical analysis of the lung framework of cattle has been carried out to compare its chemical constituents with histologically visible components.

In addition to 40% of water extractable material believed to be collagen, the chief component of the lung framework is *reticulin*, a carbohydrate-protein complex. The carbohydrate moiety is made up of galactose, glucose, mannose, and fucose units (as seen by paper chromatography of a hydrolysate prepared by means of a cation exchange resin). This reticulin is believed to be the characteristic chemical component of reticular (argyrophilic) fibres in lung as well as in other tissues.

These results are in fair agreement with the proportions of these materials seen on histological study with the silver impregnation and periodic acid-Schiff techniques.

This work was supported by a grant from the National Cancer Institute of Canada to Dr. C. P. Leblond.

The lungs were obtained from Canada Packers Ltd., Montreal, through the kind co-operation of Mr. G. McDavid.

#### REFERENCES

1. BARGMANN, W.: Die Lungenalveole. in Handb. d. mikr. Anat. d. Menschen. by W. V. Möllendorff, Vol. 5; Julius Springer, Berlin, 1936.
2. MILLER, W. S.: The Lung, C. C. Thomas Publishers, Springfield, Ill., 1950.
3. HAYEK, H. v.: *Erg. d. Anat. u. Entwicklungsgesch.* 34: 144, 1952.
4. LEBLOND, C. P.: *Am. J. Anat.*, 86: 1, 1950.
5. LEBLOND, C. P. AND BERTALANFFY, F. D.: *Canad. M. J.*, 65: 263, 1951.
6. LOW, F. AND DANIELS, C. W.: *Anat. Rec.*, 113: 437, 1952.
7. GLEGG, R. E., EIDINGER, D. AND LEBLOND, C. P.: *Science*, 118: 614, 1953.
8. JEANES, A., WISE, C. S. AND DIMLER, R. J.: *Anal. Chem.*, 23: 415, 1951.
9. CHARGAFF, E., LEVINE, G. AND GREEN, C.: *J. Biol. Chem.*, 175: 67, 1948.
10. HORROCKS, R. H. AND MANNING, G. B.: *Lancet*, 256: 1042, 1949.



## NEWS ITEMS

### ALBERTA

Dr. J. A. Osborne formerly of Medicine Hat and a graduate of the University of Alberta, has been appointed Director of the Cardiac Laboratories at the Baylor hospital in Dallas, Texas. Following postgraduate work in Los Angeles he obtained a fellowship with the Nuffield Foundation and spent further time in England.

The newly-formed Alberta Psychiatric Association had its formation in Red Deer. The meeting was called by Dr. R. R. MacLean, Director of Mental Health for the Province and President of the Dominion organization. Dr. L. J. LeVann of Red Deer was appointed President; Dr. G. D. Carson of Edmonton Vice-President and Dr. J. M. Byers of Ponoka Secretary.

Dr. H. McEwan of Calgary was appointed an Associate Editor and Dr. M. Cantor, Assistant Editor of the *Alberta Medical Bulletin*. We welcome these new members and thank Dr. Morley Tuttle of Calgary for his good services during his period of office in Calgary.

We regret to announce that Dr. Donald Wilson of Grande Prairie has not been located since the tragic air accident in November while flying a poliomyelitis patient to Edmonton.

Dr. and Mrs. Frank Elliott and Dr. and Mrs. E. S. Allin of Edmonton are spending a well earned holiday in the South Pacific.

Alberta was featured by a "green" Christmas this year much to the disappointment of the younger generation with their new skis and sleighs. A number of the doctors went to Banff and Jasper for their sliding exercise.

W. CARLETON WHITESIDE

### BRITISH COLUMBIA

The new President of the Medical Services Association, elected following the Annual Meeting, is C. C. Smith of Powell River. Mr. Smith is an executive of the Powell River Pulp & Paper Company, and has been a director of M.S.A. for some time. The Annual Report of the M.S.A. shows that one in six of the population of British Columbia comes under M.S.A. and is eligible for medical benefits. Over half a million medical bills were received last year, and the cost of administration is the lowest (5%) of any Prepaid Medical Care plan on the continent.

We regret to report the serious illness of Dr. D. E. H. Cleveland of Vancouver, who was taken ill while attending a Dermatological Congress in Chicago. His early recovery is hoped for.

For the second time in eighteen months, the Royal Canadian Navy has co-operated with the Provincial Department of Health by sending one of its ships, with portable x-ray equipment on board, to Communities on B.C.'s West Coast.

*H.M.C.S. Porte Quebec*, the ship in question made the trip in September up the stormy West coast of Vancouver Island, calling at many points, including Ucluelet, Tofino, Tasis, Zeballo and others. The ship would tie up at the community wharf, and citizens would come aboard to have their x-rays taken by a technician from the Division of Tuberculosis Control. Arrangements for the use of the ship were made between the Health Branch and Rear-Admiral J. C. Hibbert, Flag Officer, Pacific Coast. This service could not have been provided for these areas, if it had not been for the "help and splendid co-operation" of the Navy.

The control of illuminating gas devices, including ovens and heaters, has become a very live question in Vancouver of late. Some 90 deaths for the year, of which more than half were clearly accidental, have aroused the municipal authorities to realization of the serious problem presented by old and worn-out equipment. There are many lodging-houses and housekeeping rooms, where pensioners and poor people live; they have been ordered to install safety devices, with a view to lessening at least the accidental injuries, and a general tightening-up of inspection has been instituted.

St. Vincent's Hospital, in Vancouver, opens its new million-dollar wing on December 7. Present as guests will be Hon. Eric Martin, B.C. Minister of Health, and Hon. Ralph Campney, Federal Minister of Defence. This new addition, which has been built in record time (less than fifteen months) will increase the capacity of the Hospital to 200 beds. It has the modern operating-rooms, maternity and children's departments.

Victoria is soon to have a new Medical Arts Building at Pandora and Cook Street. It will be a thoroughly modern three-storey building, to provide doctors' and dentists' offices—will have its own parking space, and so on.

Nanaimo General Hospital will shortly have a 50-bed addition. This was announced recently by the hospital directors. New electrical equipment will also be installed.

The B.C.H.I.S. is beginning to show that the warning given by Health Minister Eric Martin, that steps would be taken to enforce the act fully, is seriously meant. Certain firms that have not been complying with the regulations concerning payroll deduction, are to be sued in court.

The new Provincial Health Building in Vancouver, now under construction on Tenth Ave. West near the Vancouver General Hospital, will provide ample room for all provincial health facilities. This will be a great boon to the Public Health Laboratories, hitherto maintained in very cramped and unsuitable quarters. The Assistant Provincial Health Officer will have his headquarters here, as will the Division of Vital Statistics, and the Divisions of Tuberculosis and Venereal Disease Control. The Red Cross Blood Transfusion Service will occupy one floor. In all, the building will cost close to \$2,000,000.00. It will enable the Provincial Health Branch to maintain close relationship with the Faculty of Medicine of the U.B.C., in its teaching at the Vancouver General Hospital, through its clinical and laboratory facilities.

J. H. MACDERMOT

### MANITOBA

Plans have been completed for construction of a 16-bed hospital at Deloraine, a 10-bed nursing unit at Melita and a 4-bed nursing station at Waskada. The total cost of the three projects in the newly organized Deloraine hospital district is estimated at \$275,000. Included in the district are towns of Deloraine and Melita, villages of Waskada and Napinka, rural municipalities of Winchester, Brenda, Arthur, Edward and Albert. X-ray services will be provided for outpatients at Deloraine and Melita units.

Manitoba Medical Centre has requested grants totaling \$700,000 to be spread over a period of three years, under the National Health Program. The Centre consists of the Winnipeg General Hospital, including the Maternity Pavilion, the Children's Hospital, the Cancer Diagnostic and Treatment Clinic, the Central Tuberculosis Clinic, the Provincial Psychiatric Hospital, and

the Provincial Laboratory. Federal Health Minister Paul Martin noted that the Children's Hospital of Winnipeg was the first centre in Canada to undertake research work in connection with the Rh factor in blood. Hon. Mr. Martin stated that the Premier of Manitoba, Douglas Campbell, has intimated that his government will make a similar contribution to that provided by the National Health program.

*The Winnipeg Tribune* is inviting its readers to send in selections for Citizen of the Year. The first letter opened suggested the name of Dr. John Hildes, superintendent of King George Hospital, where the majority of the victims of Manitoba's poliomyelitis epidemic were treated. "The example he set to his staff was truly amazing—and in the best traditions of the medical profession."

ROSS MITCHELL

## NEW BRUNSWICK

New appointments to the Saint John General staff included Dr. Geo. W. Bate to the Outdoor staff and Dr. K. C. Rodger and Dr. I. A. Karrel as physicians on the Indoor Medical staff.

Dr. W. D. Miller of Saint John, has received his fellowship in Surgery from the Royal College of Physicians and Surgeons of Canada.

Dr. R. J. Collins addressed the clinical staff of Lancaster D.V.A. Hospital at their December meeting on "Tuberculous Meningitis".

Dr. A. M. Clark of Fredericton, Assistant Chief Medical Officer and the New Brunswick Representative on the National Advisory Committee on Rehabilitations, attended the meeting of the American Public Health Association in New York in November, and visited several rehabilitation centres in the U.S.A. Dr. Clark also attended the National Advisory Committee on Rehabilitations at Toronto.

Officers of the Standardization Board of the Saint John General Hospital for 1954 are: President—Dr. J. A. Caskey; Vice-President—Dr. D. F. Sutherland; and Secretary—Dr. R. E. Washburn.

Dr. K. C. Rodger and Dr. I. A. Karrel were recently certified in Internal Medicine and Dr. Leonard Stephen received certification in General Surgery. These three doctors are all attached to the staff of the Saint John General Hospital.

A. S. KIRKLAND

## NOVA SCOTIA

Dr. R. J. Weil, Assistant Professor of Psychiatry, Dalhousie University, attended by invitation a conference at the New York Academy of Medicine to take part in a discussion on "Convergence of Views of Etiology of Mental Illness".

Dr. W. E. Stevenson, Director of the Department of Neurosurgery, Victoria General Hospital, recently visited Newfoundland under the auspices of the postgraduate committee of Dalhousie University. Dr. Stevenson visited St. John's, Cornerbrook and Grand Falls where he gave several lectures and held clinics on neurosurgical problems.

Dr. Harold Sinclair Tait, Dalhousie, M.D., C.M. '14, who has been acting as superintendent of the Weston State Hospital, West Virginia, has been appointed superintendent, by the Governor and Senate of the State.

Dr. John H. Budd, Dalhousie, M.D., C.M. '33, has been elected president of the Academy of Medicine of Cleveland, Ohio. Since graduation, he has practised in Cleveland, except for a three-year service with the American Medical Corps. He is also vice-chief of staff of Cleveland's Deaconess Hospital.

Edwin Cameron, Dalhousie, M.D., C.M. '27, former chief of the division of local health administration, resigned from the Connecticut state department of health, and is at present affiliated with the Point 4 Program of the United States Government.

Dr. R. O. Jones, Professor of Psychiatry and Dr. F. A. Dunsworth, Assistant Professor of Psychiatry, recently attended meetings of the American Psychiatric Association in New York and Montreal.

Dr. K. M. Grant, Associate Professor of Obstetrics and Gynaecology, Dalhousie University, visited Chatham and Campbellton, N.B., where he spoke on "The Treatment of Non-convulsive Toxæmias of Pregnancy".

C. M. HARLOW

## ONTARIO

The St. Catharines General Hospital has opened an addition called the James Morris Clinical Building, named after the late Captain James Morris, a member of the first board of governors which met in 1865. Included in the new wing is a twenty-two bed mental in-patient clinic, a pilot plant designed for early treatment of mental illness.

Dr. Frank Crusen of the Mayo Foundation addressed the Canadian Association of Occupational Therapy at their annual convention in Toronto. He said that science was faced with the immediate prospect of treating chronic illness and serious disability rather than battling with acute diseases. Urgent action is needed to deal with rehabilitation. Occupational therapy as an expanding study should include psychology, science, social work, aptitude measurement, job placement, the science of motion and recreational study.

Dr. H. Hoyle Campbell, Toronto was re-elected president of the Association.

Dean J. A. MacFarlane has been elected president of the Medico-Legal Society of Toronto.

The Laboratory Section of the Canadian Public Health Association held its twenty-first annual meeting in Toronto. Twenty-nine papers were read. Among those of general interest were: Laboratory Diagnosis of Some Virus Diseases of Poultry, John Fahey, Toronto; A Fatal Infection due to *Listeria monocytogenes*, A. E. Allin, Fort William; The Typing of Canadian Strains of Poliomyelitis Virus in Tissue Cultures, Darlene Duncan and A. J. Rhodes, Toronto; Five Cases of Serologically Positive Toxoplasmosis with Isolation of the Parasite in One Instance, M. W. Fujiwara and J. Marion Johnson, Toronto; Family Epidemics of Ringworm Contracted from Cattle, F. Bland and Gibson E. Craig, Montreal; Sporotrichosis: A Report of Three Cases from the Toronto Area, Gordon H. Hawks; Generalized Cryptococcosis, Thomas Brown; Nocardiosis, Two Case Reports, Marion Ross; Blastomycosis, Case Report, Phillip Greey; Infections experimentales avec des colibacilles pathogènes. Essais d'immunisation active et passive, Armand Frappier et Sorin Sonea, Montreal; An Epidemic of Infectious Hepatitis Affecting a Rural Community in Canada, R. M. King, Anne Quigley, J. C. Sinclair and C. E. van Rooyen.



The Health League of Canada held its annual meeting in Toronto. Dr. Harold Segall, Montreal, spoke on The Health of the Executive. Panel discussions were held on Health Education, on Principles of Industrial Health, on Civil Defence, on Retirement Program for Industry, and on What's Wrong with our Plans for Older People?

Dr. Ronald Buchan, director of Employee Health, Prudential Life Insurance Company, Newark, N.J. spoke on The Retirement of the Worker; Dr. W. B. Scott, Unemployment Insurance Commission spoke on Employment of the Older Worker and Professor V. W. Bladen, Department of Political Economy, University of Toronto spoke on Industrial Relations.

Mr. Charles Luther Burton, C.B.E., laid the cornerstone of Burton Hall, Nurses' Residence and Training School of Women's College Hospital on December 18. This building will provide each of the 215 nurses living in with a single room. Each floor will have a kitchenette; lounges, a recreation room and adequate laundry facilities will be provided. Teaching will be done in modern classrooms.

Grants to hospitals throughout the province from the provincial government totalled \$3,143,658 in 1953. These grants went to 39 municipalities. More than \$500,000 went to Toronto hospitals, with the next largest grant, \$332,000 going to Hamilton.

This year 225 beds were provided for the aged in homes completed at Sudbury and Prescott. Extensions to existing homes in Grey, Simcoe and Huron counties provided another 139 beds. Grants were made for a 319-bed home in London and an 80-bed home in Brant county. Most of the homes built have been of single-story construction with bed or semi-bed treatment available for those requiring it. Many patients formerly bedridden are now getting around in their new homes.

Congratulations to Dr. F. B. Bowman of Hamilton, on his being appointed president of The Philippine Club.

LILLIAN A. CHASE

## QUEBEC

The 1954 slate of medical events in Montreal lists several important events. The American College of Surgeons will meet here at the end of March; the American Association for Thoracic Surgery will meet in May; the Canadian Society for the Study of Fertility will have its annual get together in October; while the biggest scientific meeting so far scheduled is the International Psychological Congress in June, immediately after the Canadian Psychological Congress.

Two new memorial lectures were inaugurated in Montreal this past year. One was in memory of Dr. Francis Shepherd, chief surgeon of the Montreal General Hospital and Dean of Medicine at McGill University. The other commemorated Dr. Donald E. Hingston, one of the founders of St. Mary's Hospital. Other firsts, during 1953, included an open house at Montreal hospitals in May and a course in July at McGill in Mycology.

Montreal is currently the biggest hospital builder in the country. No doubt this will continue just as intensively in 1954 as in the year that is closing. 1954 will see official openings of the new wing of the Royal Edward Laurentian Hospital on St. Urbain Street and the new Pavilion D of Ste. Jeanne d'Arc just down the street. Also scheduled for early completion are the new Maisonneuve General in Rosemount and the new wing of Notre Dame de l'Esperance in Ville St. Laurent. Later in the year the new West Wing of the Jewish General and possibly a portion of the huge new Montreal General Hospital will open to patients. In regard to the latter, no doubt, building will be pressed throughout 1954 so that completion can be achieved in the summer of 1955.

In 1954 construction will continue on the new wing at the Royal Victoria Hospital and on the new Ste.

Justine Hospital for Children. Portions of the Western Division of the General Hospital at Atwater will come down and late in the year the Children's Memorial, which will eventually take over the buildings, will begin construction of a new wing on Essex Street. Probably in March Notre Dame Hospital will start construction of a new 12 storey west wing. Foundations for this wing are now under way.

During 1953 a half dozen hospitals in Montreal appealed to the public for a total of nearly \$27,000,000. The Joint Hospital Fund included a campaign for nearly \$8,500,000 for the Montreal General, Royal Edward and Children's Memorial Hospitals. In addition the Ste. Justine, Jewish General and Jeanne d'Arc each sought \$6,000,000 for building purposes. Compared to 1953, the coming year seems likely to be light in terms of appeal to the public for hospital funds.

The one dark cloud in 1953, in so far as our Division of the C.M.A. is concerned, has been the drop in membership. No doubt the change in fee schedule has been a major factor. We do hope that this is only a temporary situation and that 1954 will see a reversal of this trend. It is unfortunate that so many of our colleagues do not fully appreciate the value of our Association—what it has done for our profession as a whole and for each one of us. There are still many things to be done, but these can only be accomplished providing we stick together.

The Montreal Medico-Chirurgical Society held a clinical evening at the Queen Mary Veterans' Hospital on December 4, 1953. There were some 50 excellent general exhibits by the various departments of the hospital. The attendance was better than at any previous meeting in spite of the inclement weather. The program ended with delightful refreshments prepared and served by the dietary services of the hospital. It was a very beneficial evening and enjoyed by everyone present.

On December 9, the paediatrics section of the same Society heard a symposium on eye problems for paediatricians at the Children's Memorial Hospital. Drs. H. Wyatt Laws and Arnold Katz discussed strabismus. Emphasizing that there is a strong hereditary tendency, they urged that children who show strabismus or a tendency to it should be seen by a competent eye specialist as early as six months. If caught early, appropriate treatment will encourage use of the weaker eye and so develop vision in it. Correction of strabismus cannot be achieved overnight, calling for patience on the part of the child, the parents and the doctor.

The first award of the Joseph Schubert Memorial Scholarship has been made to Dr. James R. Stuart, who is doing research work in the department of pathology at McGill. This scholarship was established by subscriptions from a large number of friends of the late Mr. Schubert who served as a member of the Montreal City Council from 1924 to 1940 and died in 1952. It is awarded by the faculty of graduate studies and research of McGill University to a student who is continuing research on the heart and its diseases.

The past five years have seen an increase of 2,000 beds for the treatment of tuberculosis patients in the province of Quebec, but this has not been matched by a corresponding increase in the number of nurses trained in the care of tuberculosis patients. This fact was brought out recently by Dr. Hugh E. Burke, medical director of the Royal Edward Laurentian Hospital in Montreal. To meet the need, Dr. Burke stated, the Royal Laurentian is making plans for a new school of tuberculosis nursing, the first of its kind in the province.

Building of the new school which will provide accommodation for 40 student nurses is dependent on the Joint Hospital Fund appeal reaching its full quota. The course planned by Dr. Burke for the tuberculosis nurses will cover a six-week period, and at this rate it should

be possible to turn out 480 nurses a year. These young women will have, in addition to their general nursing training, specialized tuberculosis training that will make it possible for them to care competently and carefully for tuberculosis patients. It is expected that when the new school is ready for occupation the Association of Registered Nurses of the province of Quebec will give their approval, thereby opening the way to affiliation with schools of nursing in all Quebec hospitals.

A. H. NEUFELD

## SASKATCHEWAN

Launching of a Provincial Government program to deal with the problem of alcoholism in Saskatchewan has recently been announced by the Honorable J. H. Sturdy, Minister of Welfare and Rehabilitation. The first step in what is to become a long range program of research, treatment, public education and rehabilitation is the creation of a Government Bureau on Alcoholism under a permanent director.

Plans are under way for the formation of a provincial advisory committee on alcoholism through which it is hoped to secure the advice of informed sources outside the Government. Provincial organizations will be asked to name representatives to this committee to study all aspects of the problem as it affects the Province, and to make positive recommendations for a program suited to the needs of Saskatchewan.

Dr. G. F. A. R. Gibson has been appointed regional medical health officer for the Weyburn, Estevan Health Region with headquarters at Weyburn.

In the Saskatchewan Court of Appeal the action between Dr. David Arnott of London, Ontario, plaintiff, and the College of Physicians and Surgeons of Saskatchewan, defendant, was heard. In the resulting judgment delivered December 11, 1953, the appeal of the College of Physicians and Surgeons against the judgment given earlier against the College was allowed and the action ordered dismissed.

In discussing the case Mr. Justice Gordon stated, "It is clear from the evidence of the plaintiff (Dr. Arnott) that he has developed such a sense of persecution that it has influenced his judgment. He pledged his oath that Dr. Koch was thrown out of the United States because he was saving too many lives. He further stated that there was no one competent in Canada to pass upon the Koch treatment, also that he did not believe that the doctors in Saskatchewan were anxious to find a cure for cancer."

Chief Justice Martin in his judgment stated that he agreed with the learned trial judge when he stated that the fullest discussion among medical men at a meeting of themselves would seem to be desirable so long as it bears on a matter of interest to them and to their profession, and there is no malice against a person who may be defamed. He continued, "I think it appropriate to say that the College of Physicians and Surgeons, made up of all licensed practitioners in the province, is a provincially incorporated body—and is in the nature of a quasi public institution. It does not exist merely for the protection of its members in their professional capacity but also for the purpose of safe-guarding the health and welfare of the people of the Province." As such Chief Justice Martin felt that it was a privileged occasion when the matter complained of was discussed and distributed in the *Quarterly* to the members of the College.

Later he stated that, "It is in the interest of the people of the Province that members of the profession should be able to express their opinions freely in regard to any alleged cure for the disease (cancer)."

In commenting on articles published in the *J.A.M.A.* and the *C.M.A.J.*, Chief Justice Martin agreed with the learned trial judge that these articles are not evidence of the truth of the contents of the articles but are however the recognized mediums of information for the pro-

fession in both the United States and Canada. "I do not think anyone should question the good faith of members of profession who rely on information obtained in these Journals and form their opinions as to whether or not treatments dealt with and criticized are worthless or not."

In his concluding sentence Chief Justice Martin states: "With all the information available, the members of the College could with honesty and integrity condemn the Koch treatment in the strongest terms."

Medical men interested in fishing will be pleased to hear that the Fisheries Branch of the Provincial Government has planted approximately 12,000,000 eggs, fry, fingerling and adult fish in Saskatchewan waters this year. Of this amount 6,200,000 were pickerel, fry and 156,000 trout of other varieties than the Lake Trout. About 1,000,000 Arctic grayling fry were also distributed.

Dr. Robert W. Irwin, son of Dr. O. M. Irwin, well known practitioner of Swift Current, was recently awarded the Prowse Prize by the University of Manitoba for original research. This article appears in the December issue of *Surgery, Gynecology and Obstetrics*. Dr. R. W. Irwin is at present studying surgery at the Montreal General Hospital. He is the youngest of three sons of Dr. O. M. Irwin, all of whom are graduates of Medicine.

G. W. PEACOCK

## NEWS OF THE MEDICAL SERVICES

### Canadian Armed Forces

The following medical officers of the Canadian Army were successful in the examinations recently conducted by the Royal College of Physicians and Surgeons of Canada: Fellowships in General Surgery, Major I. F. Barwell-Clarke; Certificate in General Surgery, Lieut.-Col. A. B. C. Powell; Certificate in Internal Medicine, Major R. Feuiltault; Certificate in Otolaryngology, Capt. J. H. Sherry.

The following officers have recently returned from Europe after serving a tour of duty with the Canadian Forces in Germany: Major C. S. Bowlsby, Capt. H. C. Harley, Capt. F. S. Hogarth, Capt. W. J. Vail, Capt. C. R. Davidson, Capt. P. S. Degrosbois, Capt. B. P. Brisson, Capt. B. E. Morgan.

The following medical officers of the Royal Canadian Air Force were successful in the examinations recently conducted by the Royal College of Physicians and Surgeons in Canada: Fellow, Royal College of Surgeons, Squadron Leader S. Murphy; Certification in General Surgery, Squadron Leader J. A. V. Hamilton; Certification in Internal Medicine, Wing Commander E. O'F. Campbell; Certification in Dermatology, Flight Lieutenant J. C. Mitchell.

## NEWS AND NOTES

In conjunction with the Annual Meeting of the American Academy of Forensic Sciences, to be held in Chicago, Illinois, February 25 to 27, 1954, the Section on Pathology will hold a Medico-Legal Slide Seminar to be moderated by Dr. Arnold Strauss, Pathologist to the Chief Medical Examiner's Office, Norfolk, Virginia. This seminar is designed to cover a wide range of problems frequently encountered by forensic pathologists. The sets of slides and the protocols may be obtained by writing to Dr. Geoffrey T. Mann, Chairman, Section on Pathology, American Academy of Forensic Sciences, 404-406 North 12th Street, Richmond 19, Virginia. Each application must be accompanied by a cheque for five dollars payable to Dr. Mann.



### LEDERLE AWARDS

The Lederle Laboratories Division, American Cyanamid Company announces the establishment of the Lederle Medical Faculty Awards promising teachers and investigators in the pre-clinical sciences. The members of the Committee for the current year are: Dr. Windsor C. Cutting, San Francisco; Dr. Maxwell Finland, Boston; Dr. Robert F. Pitts, New York City; Dr. George Sayers, Cleveland; Dr. Morris F. Shaffer, New Orleans; Dr. Douglas H. Sprunt, Memphis.

Candidates for, and recipients of, Lederle Medical Faculty Awards must hold "faculty rank," such as Assistant Professor or Associate Professor (or their equivalent, as determined by the Committee) in their medical schools and should be individuals who give promise of staying on to continue teaching and research within the disciplines indicated above. Individuals chosen for the Awards are to have full privileges and responsibilities as regular faculty members for teaching and research.

Awards will be made for a term not exceeding three years, provided that the conditions of the award are fulfilled. The only restriction in the case of each recipient is that the total amount, which will be awarded at a rate to be determined by the Committee, shall not exceed \$10,000 in any one year to any one grantee.

The funds should be used primarily to increase or to create salaries for the designated individuals but they may be used, in part, to support the departmental activities of the individual within the total amount granted. Address all communications to: Lederle Medical Faculty Awards, Office of the Secretary, Pearl River, New York.

### THE ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

At the Annual Meeting of the Royal College of Physicians of Edinburgh held on Thursday, December 3, 1953, Dr. L. S. P. Davidson was elected President, Dr. Ian G. W. Hill, C.B.E., T.D., was elected Vice-President, and the following were elected Members of Council: Dr. Edward R. C. Walker, Dr. W. Lindsay Lamb, Dr. I. Simson Hall, Dr. R. M. Murray-Lyon, and Dr. Thomas Anderson. Dr. J. Halliday Croom was re-appointed Secretary, and Dr. J. Alastair Bruce was re-appointed Treasurer.

### ADDITIONAL FELLOWSHIPS AWARDED FROM J. S. McEACHERN FUND

To Dr. Georges Normand, Laval University, Quebec, for one year's study at Memorial Centre, New York in the diagnosis and treatment of cancer through surgery, x-ray, radium therapy and chemotherapy—\$3,650.00.

To Dr. G. A. Thompson, University of Toronto, for one year's study of radiotherapy and ophthalmology in Great Britain and other areas—\$3,650.00.

To Dr. H. H. Allen, University of Western Ontario, for one year's study of Gynaecological Cancer at various European centres—\$3,650.00.

A recent article in *Revista Brasileira de Medicina* by Dr. José Procopio recalls the life and work of Dr. Wolferstan Thomas of Montreal. A graduate of McGill University in 1897, Dr. Thomas eventually devoted himself to the study of tropical diseases and was the first to show the value of atoxyl in trypanosomiasis. The greater part of his active life was spent in Manaus, Brazil, on the Amazon River.

He did much to improve the sanitary conditions of his community and received official thanks, but the only trace of his name now in the town is in the name of an almshouse. He died in 1931, and recently his estate has been awarded a share of a cash prize originally offered by King Leopold II of Belgium for the eradication of trypanosomiasis.

(Continued on page 80 of the advertising section)

## BOOK REVIEWS

### MODERN TRENDS IN FORENSIC MEDICINE

Edited by K. Simpson, University Reader in Forensic Medicine, Guy's Hospital Medical School, University of London. 327 pp. illust. \$11.00. Butterworth & Co. (Canada) Ltd., Toronto, 1953.

Dr. Keith Simpson needs no introduction in the field of forensic medicine and toxicology. The demand for his first *Forensic Medicine*, published in 1947, made it necessary within a short time to reprint it; a year later it had to be reprinted again, and this was followed by a second edition in 1952. But the book under review is not a third edition; though it covers the whole field of medical jurisprudence and toxicology, the pattern differs entirely from the former works and in fact from all other works on forensic medicine and toxicology. Fitting in with the title, it concentrates upon the developments in these fields during the last ten years.

The observations are restricted to fields in which either change or reassessment has been notable, or in which a ponderous or equivocal literature has accumulated, and the wide application of *Modern Trends in Forensic Medicine* is seen throughout its pages. As examples, aside from the importance of this work to the medico-legal expert, the hospital pathologist who will read the section on "obscure autopsies" will be well rewarded. In the chapter on forensic aspects of blood groups, haematologists will find the medico-legal applications and limitations of recent developments in their field; no psychiatrist can afford to miss the chapter on electroencephalography in forensic medicine in relation to criminal responsibility; and teachers of pharmacology and therapeutics will be equally well rewarded by reading the section on the scientific basis of selective toxicity and, because of their increasing use in homes and industry, the observations on the toxicology of the newer insecticides and selective weedkillers. Hospital administrators will find very much of that which it is their duty to know in the section on "hospital authorities and negligence of staff"; and, with the increasing number of actions against physicians alleging malpractice, physicians in general may benefit very greatly by reading the section on "legal duties of medical men".

If one were to select a particular section for special comment, it would be the chapter on recent advances in toxicological analysis, useful for the hospital biochemist whose duties include this type of chemistry as for the medico-legal expert. The notes on technique and on identification of the clinically important barbiturates and of the local anaesthetic drugs of the benzoic ester group are replete with guides which the reader will not find elsewhere in such concentrated form.

The book is interestingly written, attractively printed, well illustrated and, not without interest, an example of the art in writing English.

### THE SURGERY OF PANCREATIC NEOPLASMS

R. Smith, Surgeon, St. George's Hospital, London; Examiner in Surgery, University of London; Hunterian Professor, Royal College of Surgeons. 157 pp. illust. \$6.75. E. & S. Livingstone Ltd., Edinburgh and London; The Macmillan Company of Canada Ltd., Toronto 2, 1953.

This is a book for surgeons and any surgeon will find it profitable reading. It was awarded the Jacksonian prize for 1952 by the Royal College of Surgeons of England and is worthy of that distinction. The plates illustrating the anatomical relations of the pancreas are superb. The technique of radical pancreaticoduodenal

resection is well presented as well as the palliative transduodenal resection. The indications for both are logically discussed. In general, patients past seventy years of age are excluded from the group that might be supposed to benefit from the radical procedure.

The point of view is judicial rather than enthusiastic. It is dogmatic only in insisting upon thorough exploration in cases of intractable jaundice. It is a definite aid to judgment in deciding a course of procedure. The appendix is illuminating. Some thirty-eight cases are described with their treatment and results.

#### HISTOLOGY

A. W. Ham, *Professor of Anatomy, in Charge of Histology, in the Faculties of Medicine and Dentistry, University of Toronto, Toronto.* 866 pp. illust. \$10.00. Second Edition. J. B. Lippincott Company, Montreal, 1953.

"The advances in histology over the past few years have been more numerous and significant than those of any similar period of its maturity." In his second edition to *Histology*, Professor Ham gives ample evidence to justify this opening sentence to his preface. The new edition retains the clarity and easy reading of the original book. The contents have been expanded to include many of the recent advances in histological science. For interest, the author always tends to indicate the correlation of these contributions to the general field of biology and medicine.

Some of the new major selections are: more emphasis on electron microscopy; a chapter devoted to cytological advances in nucleoprotein studies, chromosomal structure, mitochondria and cytoplasmic constituents; an expanded treatment of connective tissue; a rewritten chapter on the nervous tissue; plus many more written and illustrative additions in histochemistry, and hæmopoietic, endocrine, liver, lung and kidney tissues.

However interesting and important the material, the expanded volume in its entirety has, perhaps, increased beyond the expected requirements of the average medical student. Nevertheless, this book retains the quality of remaining within the easy comprehension of the reader and ranks as a standard text in Histology.

#### LIND'S TREATISE ON SCURVY

Edited by C. P. Stewart and D. Guthrie. 440 pp. illust. Price 45/- net. Edinburgh University Press, Edinburgh, 1953.

Medical history goes on quietly, but impressively widening its domain and cultivating its borders. The Edinburgh School under the inspiration of Dr. Guthrie is playing a part in this task, and in the present volume it has matched its achievement of last year when it produced the splendid *History of the Royal Medical Society*. This present publication commemorates in handsome form the bicentenary of one of the most far-reaching of all medical discoveries, James Lind's demonstration of the cause of scurvy. It makes available to the medical reader the *Treatise of the Scurvy*, it pays tribute to a great man and at the same time reminds us of the glories of a great medical school.

It is well to be reminded again of the excellence of scientific writing of two hundred years ago. Moreover, as the editors point out, in temper and in the handling of material Lind is surprisingly modern while in clarity and sinewy diction he is a monumental rebuke to most scientific writers of today.

Quite properly the final section of the volume is devoted to biographical studies of Lind and his contemporaries, naval history in respect of scurvy and a review of the history of the disease since the time of Lind with a final summary of our modern knowledge of ascorbic acid. The whole constitutes an epic story most attractively framed which should be of the greatest interest to readers of all conditions.

#### VISCERAL CIRCULATION - A CIBA FOUNDATION SYMPOSIUM

Edited by G. E. W. Wolstenholme. 278 pp. illust. \$6.00. J. & A. Churchill Ltd., London; British Book Service (Canada) Ltd., Toronto, 1952.

This book presents a group of 25 papers dealing with the facts and the present views of the body's visceral circulation as these were given at a recent English Symposium sponsored by the Ciba Foundation. It makes available for research workers and for those clinicians particularly interested in the basic physiological and anatomic approach to problems of blood supply the facts and surmises of the subject in a handy volume. The Symposium was chaired by Professor John McMichael and was contributed to by the foremost English authorities in the field. There are excellent reproductions of the slides and charts used and the discussion following each paper is reported verbatim. Extensive references to the literature are given.

The book is not pertinent to the practical needs of most clinicians, but it makes available for those interested in the fundamentals of the subject a most helpful and authoritative survey. There is an extensive index. The Ciba Company is to be congratulated on the intelligence and far-seeing contribution which this sort of venture represents.

#### PROSPECTS IN PSYCHIATRIC RESEARCH

*The Proceedings of the Oxford Conference of the Mental Health Research Fund, March, 1952.* Edited by J. M. Tanner. 197 pp. illust. \$5.75. Blackwell Scientific Publications, Oxford, England; The Ryerson Press, Toronto, 1953.

This book consists of the edited proceedings of the Oxford Conference of the Mental Health Research Fund, March 1952. The terms of reference of the Conference are stated (p. iii) as follows: "What are the ignorances which today principally hamper our understanding of the nature, prevention and care of mental illness? What advances in research are most likely to remove these, and so help to reduce the population of mental hospitals and institutions for delinquents?"

Since it is organized on a symposium basis, the book is not detailed and comprehensive, and therefore is limited in value. The volume may be of interest to the casual reader outside of the field of psychiatry, but appears to be of minor value to the research or clinical specialist within that particular branch of medicine.

#### CIBA FOUNDATION COLLOQUIA ON ENDOCRINOLOGY

*Hormones, Psychology and Behaviour and Steroid Hormone Administration.* Edited by G. E. W. Wolstenholme, and Margaret P. Cameron. Vol. III. 380 pp. illust. \$7.00. J. & A. Churchill Ltd., London W. 1; British Book Service (Canada) Ltd., Toronto, 1952.

*Anterior Pituitary Secretion and Hormonal Influences in Water Metabolism.* Edited by G. E. W. Wolstenholme and Margaret P. Cameron. Vol. IV. 591 pp. illust. \$9.00. J. & A. Churchill Ltd., London W. 1; British Book Service (Canada) Ltd., Toronto, 1952.

*Bioassay of Anterior Pituitary and Adrenocortical Hormones.* Edited by G. E. W. Wolstenholme, and Margaret P. Cameron. Vol. V. 228 pp. illust. \$5.00. J. & A. Churchill Ltd., London W. 1; British Book Service (Canada) Ltd., Toronto, 1953.

These three volumes comprise the proceedings of colloquia sponsored by the Ciba Foundation participated in by scientists with a wide variety of interests pertinent to the problems under discussion. In addition to the papers presented, many of which touched on work under





## ESKABARB<sup>\*</sup> SPANSULE<sup>†</sup>

for the  
continuous,  
even sedation of  
**PHENOBARBITAL**  
over a prolonged  
period of time

'Eskabarb' Spansule capsules are a logical application of S.K.F.'s 'Spansule' capsule dosage principle to phenobarbital therapy—the same principle that has been so widely accepted in Benzedrine\* Spansule and Dexedrine\* Spansule.

Unlike phenobarbital administered in any other form, 'Eskabarb' Spansule has the following advantages:

1. Continuous, even sedation throughout the day—or night—with one dose.
2. No excessive drowsiness; no nervous "breakthrough."
3. Convenience of one dose daily.

**Available:** 'Eskabarb' Spansule capsules are available in two dosage strengths, in bottles of 30.

In prescribing, please be sure to specify which you desire:

- 1 gr. (instead of  $\frac{1}{4}$  gr. phenobarbital q.i.d.)  
1½ gr. (instead of  $\frac{1}{2}$  gr. phenobarbital t.i.d.)

**SMITH KLINE & FRENCH • Montreal 9**

\*Reg. Can. T. M. Off.

† Trade Mark Reg. Can. T. M. Off. for S.K.F.'s brand of sustained release capsules

progress and not yet published, there is included the informal discussion of the papers which often makes for very lively reading. While these books will appeal mainly to physiologists, endocrinologists and biochemists, certain sections, especially those dealing with the interaction of hormones and behaviour should interest readers in all branches of medicine. In a section (Vol. III) entitled "Debate on Methodology" there is a fascinating discussion of the problems involved in putting human clinical investigation on the plane of exactitude achieved in other biological research. Vol. IV introduces some fundamental problems of human physiology in the study of the relationship between the anterior pituitary and the central nervous system. Vol. V is of limited interest to the general medical reader since it deals with the technical aspects of various bioassay methods. With the rate of progress being made in the medical sciences this type of book supplies a need which is not met by the ordinary type of textbook which is usually out of date by the time it is published.

#### CHILD TRAINING AND PERSONALITY

J. W. M. Whiting, *Graduate School of Education, Harvard University*; and I. L. Child, *Department of Psychology, Yale University*. 353 pp. illust. \$6.25. Yale University Press, New Haven; Burns & MacEachern, Toronto, 1953.

It is emphasized that this work is "oriented toward testing generalized hypothesis", whereas "most previous work has been oriented toward seeking concrete understanding of specific cases". An adequate criticism of this work would require a more academic habit of mind and more academic knowledge of the fields of psychology and social anthropology than most clinicians are likely to possess. However, psychiatrists and paediatricians who have the tenacity to read it will find that it discusses fields and methods of investigation which should eventually lead to better understanding of the broad cultural backgrounds of their work.

The term "training a child out of his dependence" and the assumption that satisfaction is a learned response seem to suggest a type of psychological thinking that is in conflict with the psychobiological notion that children's growth towards independence is encouraged when their dependent needs are satisfied. This point is of some importance in connection with the general criticism of this work because "positive" and "negative" fixations are taken as being very important in the establishment of individual habits and by implication of cultural customs. It seems to this reviewer that the potency of a "positive fixation", that is the type of behaviour which has been retained because it was highly rewarded in infancy, is overrated.

It is argued that "if child training practices in a society were such as to make oral behaviour especially rewarding to its members, then in the face of anxiety

about illness they might resort to some form of oral behaviour as a therapeutic practice". It is assumed that when illness is accounted for as due to spells and incantations, there is evidence of anxiety about oral activity, and a satisfactory co-relation is found between this sort of etiology and rather stringent methods of socializing oral behaviour. On the other hand, in reviewing therapy where a relationship between oral gratification in infancy and the taking of remedies by mouth might seem to be plausible, no convincing relationship is found.

Those examples may give some indication of the sort of hypotheses that are being tested and of the rather wobbly assumptions upon which very ingenious arguments are built. The material of this book is certainly interesting, but some of the reasoning is not very convincing and the style makes it heavy going.

#### MID-CENTURY PSYCHIATRY

R. R. Grinker, *Director of Institute for Psychosomatic and Psychiatric Research and Training, Michael Reese Hospital, Chicago, Illinois*. 183 pp. \$6.00. Charles C. Thomas, Springfield, Ill.; The Ryerson Press, Toronto, 1953.

A brief review can never do justice to a collection of concentrated essays. This timely symposium is composed of the contributions of eminent workers in the field of Psychiatry. We have here, under one cover, a collection of reviews of the various aspects of the current development of psychiatric interests. Clearly presented is the importance of the study of total human behaviour in the discipline of Psychiatry, and more particularly in the three abstractions, biological, psychological, and social behaviour. The present conception of the mind and cortex and the value of the contributions resulting from the various disciplines of Medicine, are clearly and succinctly summarized by Dr. Percival Bailey. The still unbridged chasm between the physiologist and the philosopher is very apparent and still presents the ultimate challenge to future workers. Psychiatry can never again achieve, either by accident or design, the peculiar isolation that it has enjoyed (?) in the first half of this century. It would seem that a closer collaboration in thought and planned study, with the recent advances in high level Neurology, will be fruitful of a more dynamic approach to many psychosomatic problems. Dr. Engel reviews the development and the evidence in favour of the unitary concept of health and disease. Stress is again laid on the necessity for understanding man's basic needs and his means of adaptation in physical, organic and social environment. The importance of understanding the psychosomatic is granted by the reviewer but its relative importance must be gauged carefully to each individual and broad concepts frequently appear of little value in these discussions. A considerable portion of this book is devoted to psychoanalysis. The concept of the Un-

*lung infection?*

**ESTOPEN injection**

Trade mark

- the penicillin that reaches the lung in strength
- vials of 100,000, 500,000 and 2,500,000 units
- Separate pack of "water for injection" available



GLAXO (CANADA) LTD., 26, DUNCAN STREET, TORONTO, ONTARIO



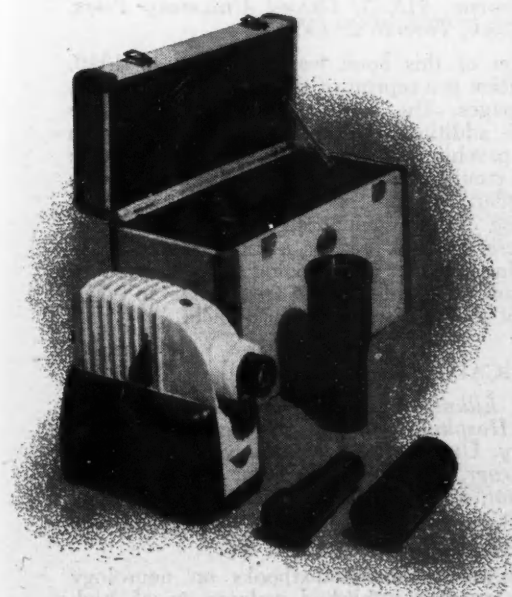
Pigmented mole, preoperative.



To present  
every detail  
*brilliantly...*

**in moderate light... to large audiences.**

**THE AUDITORIUM IS LARGE;** the light, moderately bright, cannot be reduced. Color slides 2 x 2-inch, of great detail, are to be presented for study and discussion. The situation calls for a projector of great power and authority...



**Use the Kodaslide Projector, Master Model.** With the 1000-watt lamp it can deliver more light to the screen than any other 2 x 2-inch slide projector made. Choice of four Lumenized projector lenses. Slides protected by heat-absorbing glass with built-in fan which forces air to lamp, condenser system and both sides of slide. Operates on 60-cycle AC. Price, with Kodak Projection Ektanon Lens (Lumenized), 5-inch  $f/3.5$ , and Adapter, \$203.50. Carrying case, \$61.50. Prices subject to change without notice.

For further information see your photographic dealer or write:

CANADIAN KODAK CO., LIMITED  
Toronto 9, Ontario

*Serving medical progress through Photography and Radiography*

**Kodak**  
TRADE-MARK

conscious is traced through Freud's development of the ego and libidinous, or aggressive and erotic instincts and their pre-conscious passage where the physiological and mental energies are represented. Their importance and the patient's reaction when their interaction activates a response on the pleasure-pain principle is stressed as a fundamental concept. An interesting discussion is presented that in physiological reactions chemical substances will be found which will function as the somatic substrate for the mental representation of an instinctual tension such as appetite. Stress in its modern connotation appears to be the psychosomatic watchword. Exception is taken to Dr. Alexander's implication that only the psychiatrically oriented and trained can place "tests" in their proper perspective and treat the patient as a whole being. Psychiatry of course, can never function efficiently without thorough understanding of all the disciplines of Medicine, and vice-versa.

#### SANDOZ ATLAS OF HÆMATOLOGY

*Published by Sandoz Ltd., Basle, Switzerland. 91 pp. illust. \$5.00. Sandoz Pharmaceuticals, Division of Sandoz (Canada) Ltd., 286 St. Paul Street W., Montreal 1, Que.*

This atlas of hæmatology is designed to meet the needs of the practising physician. The blood cells are faithfully portrayed and may be used readily as a diagnostic aid by the modern physician in interpreting diseases of the hæmatopoietic system. The atlas is divided into three sections, the first gives a brief account of the basic principles of hæmatology, the second is devoted to a systemic description of the various groups and species of blood cells and their development and the third, contains illustrations of normal and pathological elements found in the blood and hæmopoietic organs.

This edition contains 91 pages and 579 photographs in the course of which, all known cells of the blood and hæmopoietic organs are included. It should receive the same favourable reception that was accorded the French and German publication of 1949.

#### MEDICINE

*A. E. Clark-Kennedy, Fellow of Corpus Christi College, Cambridge; Physician to the London Hospital and Dean of the Medical School. 410 pp. \$4.75. E. & S. Livingstone Ltd., Edinburgh and London; The Macmillan Company of Canada, Toronto, 1953.*

This is not a textbook of medicine in the ordinary sense of the word. It has been written for the medical reader regardless of the particular stage of his career and provides a basis on which a knowledge of medicine can be built by observation and self-education as experience grows. An approach has been adopted to the problems of medical practice which is more philosophical than is usual in textbooks. The author has recognized from the outset that the capacity of the human mind has not increased to keep pace with advances in human knowledge and that memory is strained to the breaking point. In re-writing volume I for this second edition the author has borne this in mind and has resisted the temptation to increase the length of the book, although trying to incorporate views which have developed in the course of the ten years since the publication of the first edition.

The chapters dealing with the body-mind relationship, with many symptoms and signs, with the normal and abnormal reactions of the mind, and with the problem of the nature of disease have been thoroughly revised. Volume I is now more in line with volume II which deals with the less fundamental problems in medicine and was written at a later date than the first edition of volume I.

Anybody interested in fundamental principles rather than in the details of medical practice will thoroughly enjoy reading this introduction to the philosophy of one of the leaders of British medicine today.

#### GROUP PSYCHOTHERAPY

*F. B. Powdermaker, Responsible Investigator, and J. D. Frank, Principal Assistant. 615 pp. illust. \$7.15. Published for the Commonwealth Fund by Harvard University Press, Cambridge, Mass.; S. J. Reginald Saunders and Co. Ltd., Toronto, 1953.*

This is an interesting report of a project which utilized the experiences of twenty-two psychiatrists, as well as psychologists and social-workers. Therapy was undertaken with two groups of patients—neurotic and schizophrenic. The entire program of treatment is frankly described from its inception, and includes the selection of the groups; the initial meetings and early difficulties; the accomplishments and failures; and a full discussion of results. The casual reader will find the "Summary and Implications for Therapy" at the end of each chapter of great theoretical interest and practical value. The more careful reader will be stimulated by the verbatim accounts of "situations" which arose during meetings, and by the consideration of their significance.

This reviewer is impressed by the evidence of caution and honesty with which the views of the several authors are put forward. This is exemplified by the first two of the appendices. The first is titled "Running Accounts of the First and Sixty-fifth Meetings of the Same Group". The second is called "The Completeness and Accuracy of the Running Account" and constitutes a frank criticism of the first. Sample chapter headings are Hostility toward the Doctor, Antagonism between Group Members, Doctors' Characteristics in Relation to Therapy, Dealing with Prolonged Silences in Schizophrenic Groups, Evaluation of a Patient's Therapeutic Progress.

An experience of this sort, reported in this way, is an example of the best kind of psychiatric research. Every psychiatric worker who has anything to do with group therapy should read it.

#### PSYCHIATRIC DICTIONARY

*L. E. Hinsie, Formerly Professor of Psychiatry, College of Physicians and Surgeons, Columbia University, New York; and J. Shatzky, Research Librarian, New York State Psychiatric Institute and Hospital. 781 pp., 2nd ed. with supplement. \$15.75. Oxford University Press, New York, Toronto 2, 1953.*

The first edition of this book was published in 1940. This second edition is a reprint of the first, plus a supplement of 218 pages. The supplement is also available published as an additional volume. The book fills such a real need in psychiatry that one is reticent to criticize it. There is no similar dictionary in English that comes up to the standard set by this work. It should be at hand for the use of all psychiatrists and advanced students as a reference book and as a guide through the intricacies, redundancies, and neologisms of modern psychiatric jargon. It could be read from cover to cover with great profit to those working in the field.

#### CLINICAL NEUROLOGY

*F. A. Elliott, Assistant Physician to Charing Cross Hospital, B. Hughes, Professor of Neurosurgery, University of Birmingham, and J. W. A. Turner, Neurologist to Saint Bartholomew's Hospital, London. 751 pp. illust. \$8.50. Cassell and Co., London; British Book Service (Canada) Ltd., Toronto 6, 1952.*

Although there are so many textbooks on neurology available, this recently published volume is of high calibre and should be popular with students and graduates alike. The authors state that it is designed for the



---

CONNAUGHT

---

# ANTI-MEASLES SERUM

*Concentrated and Irradiated Human Serum*

## FOR MODIFICATION OR PREVENTION OF MEASLES

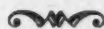
Human serum prepared from the blood of healthy adults so as to involve a pooling from a large number of persons provides an economical and effective agent for the modification or prevention of measles.

Modification is often preferable since it reduces to a minimum the illness and hazards associated with measles, but does not interfere with the acquiring of the active and lasting immunity which is conferred by an attack of the disease. On the other hand, complete prevention of an attack of measles is frequently desirable, and can be accomplished provided that an ample quantity of serum is administered within five days of exposure to the disease.

Serum supplied by the Connaught Medical Research Laboratories is concentrated to one-third the volume of normal adult serum and is irradiated so as to minimize the occurrence of homologous serum jaundice.

### HOW SUPPLIED

Irradiated Anti-Measles Serum, pooled and concentrated, is distributed by the Laboratories in 5-cc. rubber-stoppered vials.



**CONNAUGHT MEDICAL RESEARCH LABORATORIES**  
**University of Toronto** **Toronto, Canada**

Established in 1914 for Public Service through Medical Research and the development of Products for Prevention or Treatment of Disease.

---

postgraduate student primarily, but the method of presentation renders it suitable for senior undergraduate students as well. The book is divided into two parts, the first dealing with the principles of neurological diagnosis while the second part covers diseases of the nervous system. Throughout the book an attempt is made to explain clinical phenomena in terms of anatomy, physiology and pathology.

The book is extremely well written and the authors have succeeded admirably in presenting their material with clarity and brevity. Nothing essential is omitted, but the emphasis is on the more common problems of neurology. In considering treatment, only methods whose efficacy has been firmly established are described. One minor criticism is the limited number of illustrations in the book. There are certain sections where the addition of an anatomical diagram or of a photograph to show the pathological lesion, could be a distinct advantage.

This book adds another to the many outstanding contributions that have been made by the great British school of neurology and it can be highly recommended to all students, undergraduate and postgraduate, who desire a comprehensive, readable textbook of clinical neurology.

#### ANNUAL REVIEW OF MEDICINE

*Edited by W. C. Cutting, Editor, Stanford University School of Medicine, and H. W. Newman, Associate Editor, Stanford University School of Medicine. Volume 4, 452 pp. \$6.00. Annual Reviews, Inc., Stanford, California, U.S.A., 1953.*

This volume covers as wide a field as its predecessors. In addition to the more conventional branches of medicine, this volume also includes chapters on psychiatry,

radiology, obstetrics and plastic surgery. This volume, like the earlier ones, is highly recommended as an authoritative guide to current trends in medicine, with emphasis on the more highly specialized aspects of the subject.

#### SOCIAL ASPECTS OF DISEASE

*A. L. Banks, of Lincoln's Inn, Barrister-at-Law; Professor of Human Ecology in the University of Cambridge. 373 pp. \$3.40. Edward Arnold & Co., London, England; The Macmillan Co. of Canada Ltd., Toronto, 1953.*

Social science is so wrapped up with medicine that it is necessary for students in that department to have a wide knowledge of disease, and its impact on society. Dr. Banks, who is a barrister-at-law, has undertaken to discuss at some length the relation of the patient to the medical and social administration of his country. This embraces not only the disease from which the patient suffers, but the prevention, where possible, the protection of the community and his rehabilitation and return to the herd. This is covered thoroughly in a manner well suited to the needs of the social student, in language largely devoid of scientific terms. The latter portion of the book deals with such questions as birth control, ageing, and the social control of the 10% of the population (in England) past sixty-five. Euthanasia is discussed from the physicians' standpoint, quoting from Blackstone, two hundred years ago, "Mankind will not be reasoned out of the feelings of humanity", and from Lord Horder as late as 1950. When a son of an old man, dying peacefully, asked "Doctor, when is this agony to stop?" Lord Horder's reply was "Whose agony?"

The book is an excellent liaison between public health and social service.

#### GENETICS AND DISEASE

*T. Kemp, Professor of Genetics, University of Copenhagen. 330 pp. illust. 30 Danish Kr. Ejnar Munksgaard, Copenhagen, 1951.*

Few textbooks on medical genetics provide both an exposition of elementary genetic principles and information of practical value to physicians about the genetic factors in specific diseases. This volume written by the distinguished director of the famous University Institute for Human Genetics in Copenhagen, combines these features in a form admirably suited to the needs of the medical student and practising physician. A section on elementary genetic principles is followed by one on the techniques of human genetics. The latter half of the book is concerned with a review of present knowledge concerning the heredity of normal hereditary characteristics and a summary of the genetic factors in human disease. Although the need for brevity makes the presentation of some of the information somewhat dogmatic, this can hardly be avoided in a text short enough to be useful to the physician. The material presented should be of great value to medical students, physicians, social workers, marriage counsellors, and all those concerned with the problems of heredity in disease.

#### MEDICAL HISTORY OF THE SECOND WORLD WAR

*Medical Research. Edited by F. H. K. Green and Major General Sir G. Covell. 387 pp. 40s. Her Majesty's Stationery Office, London, 1953.*

This volume presents an outline of the officially sponsored medical research by British investigators during the war of 1939-45. The major part is taken by the war work of the Medical Research Council. The story is told in a quiet way and yet in reading it the drama of those dark

#### FRONTAL LOBES AND SCHIZOPHRENIA

by Greenblatt & Solomon

This book presents one of the most comprehensive multidiscipline studies of lobotomy yet made. A total of 116 patients—most of them chronic schizophrenics—were subjected to intensive investigation by the clinical and research team at Boston Psychopathic Hospital. The text is supported by a wealth of tabular and illustrative material: drawings, x-rays and photomicrographs, charts, diagrams, graphs and tables. A Springer Publication. **\$12.50.**

#### A guide to the classification and identification of the ACTINOMYCETES AND THEIR ANTIBIOTICS

by Waksman and Lechevalier

Gives detailed descriptions of the most important and officially recognized species of the general Streptomyces, Nocardia and Micromonospora, all in the easy-to-use form. Production of antibiotics by Actinomycetes Antibiotic groups and keys to identification—Description of the antibiotics—Selected general references—Index. A Williams & Wilkins Book. **\$5.00.**

#### THE CHEST

a Handbook of Roentgen Diagnosis

by Rigler

Here is the long awaited new second edition of this popular book. It is profusely illustrated and indexed, and will be indispensable to all those concerned with roentgen diagnosis. A Year Book Publication. **\$8.00.**

#### DIAGNOSIS OF ACUTE ABDOMINAL PAIN

by Requarth

Never has a more practical, more specific manual been written on this important aspect of practice.

Every paragraph—every line—is pointed and factual. Thorough analysis of signs and symptoms, especially those relating to onset, Dr. Requarth establishes the patient's disease as one of several large groups. Then, through process of elimination, he reduces the possibilities, leading you logically to the final decision.

So complete! So detailed!—that even in those instances when exact diagnosis is impossible, the question, to operate or not to operate, is answered. A Year Book Publication. **\$5.00.**

#### EXPERIMENTAL SURGERY

by Markowitz

This new third edition is considerably enlarged and completely revised. Many new illustrations have been added and also many new reference to the literature. The author is joined in this edition by two well known collaborators both of the Ontario Veterinary College—Dr. J. Archibald and Dr. H. G. Downie. A Williams & Wilkins Book. **\$10.00.**

**Burns & MacEachern • 12 Grenville St., Toronto 5**



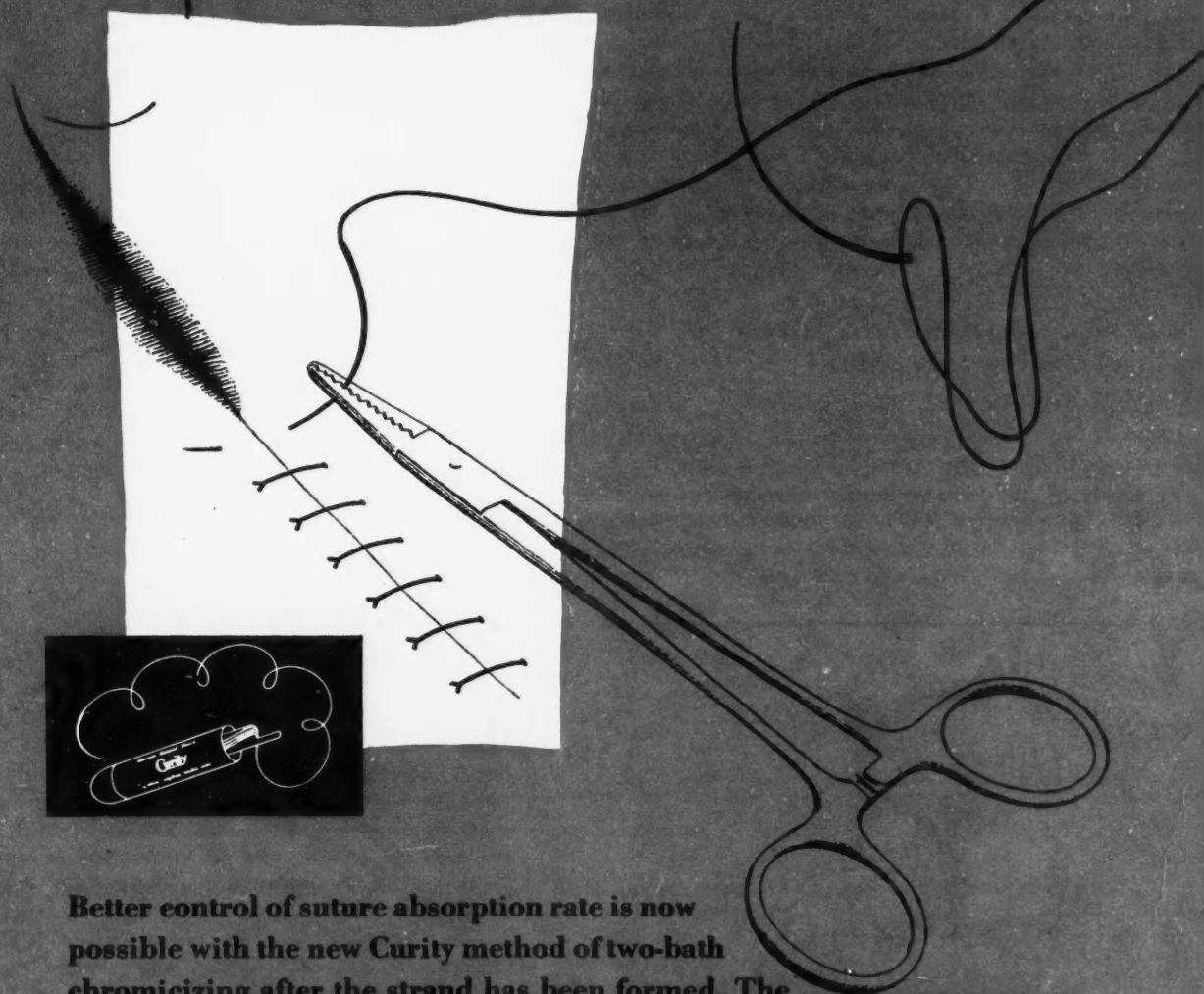






# Curity TRADE MARK chromic sutures

are chromicized with two baths  
for dependable absorption



Better control of suture absorption rate is now possible with the new Curity method of two-bath chromicizing after the strand has been formed. The first bath *does not* "tan" but permeates the strand. The solution used in the second bath combines with the molecules of the first, within the strand, achieving total, even chromicization from rim to center. As a result absorption is similarly uniform. By this method the plies are bonded by their natural mucin.

AN EXCLUSIVE PRODUCT OF BAUER & BLACK

Division of The Kendall Company (Canada) Limited

**Curity**  
TRADE MARK  
**SUTURES**

## Thirty Years Ago . . .

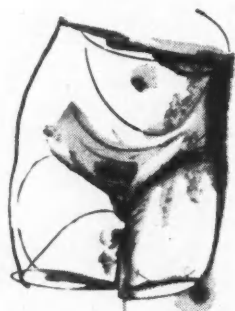
From the *Journal* of February, 1924

EXTRACT FROM "NOTES OF A VISIT TO SOME OF THE ANATOMICAL SCHOOLS AND SURGICAL CLINICS OF EUROPE IN 1887."

"Before leaving Germany I might say with regard to the surgery as seen in the hospitals, that it is nothing if not operative. It seems to me that German surgeons thought nothing of a case if they could not operate on it, and in my opinion they often operated unnecessarily and sometimes recklessly. For instance I saw a case of lymphadenoma where all the glands in the body were enlarged, neck, axilla, groins and retroperitoneal and I presume intrathoracic as well. They intended removing all they could and I saw them remove three in the neck and axillae and as soon as the wound caused by the removal of these healed they were going to tackle the groins and afterwards do an abdominal section and endeavour to remove the retroperitoneal glands. I said, 'Surely you won't stop there, why not open up the thorax and remove the intrathoracic?' They smiled and said they would wait and see the effect of the operations they had already planned."—(F. J. Shepherd).

### FROM SEMI-ANNUAL BUSINESS MEETING OF THE ONTARIO MEDICAL ASSOCIATION

"Sanction was given to the Committee on Inter-Relations to proceed with their plan calculated to enlighten the public on the work of the profession. This plan provides for the presentation of addresses to public meetings by members of our profession well qualified to speak on the various topics of interest. It is hoped that, during the coming winter, some progress will be made in connection with work.



in pruritus vulvae | relief

with **Cortef**<sup>\*</sup>  
brand of  
hydrocortisone  
(compound F)  
acetate ointment in 5 Gm. tubes

Concentrations of 2.5% (25 mg. per Gm.)  
and 1.0% (10 mg. per Gm.)

Literature available on request

\*TRADEMARK

**Upjohn** Fine pharmaceuticals since 1886

THE UPJOHN COMPANY OF CANADA, 384 Adelaide Street, West, Toronto

"Possibly the most important business dealt with by the meeting was that pertaining to medical legislation. The report of the Committee on Legislation and By-Laws presented by its able chairman, Dr. John Ferguson of Toronto, brought out the following important facts: The recent amendments to the Medical Act adopted at the last session of the Provincial Legislature have accomplished several important things, namely, defining the "Practice of Medicine", placing the onus of prosecution on the crown, and shutting the doors against further influx of irregular practitioners into this province. The Committee urges that the profession carefully watch the result of this legislation, and again be prepared to go to the Legislature as a united body, demanding that the standards for all who would undertake to treat the sick in this province be raised to a level which will adequately protect the health of the citizens."

### ACTIVITIES OF THE LEGISLATIVE BUREAU OF THE CANADIAN MEDICAL ASSOCIATION

"The Committee in charge of the Legislative Bureau of the Canadian Medical Association, in their last annual report, endeavour to indicate its future scope and usefulness in matters of legislation which affect the entire profession throughout Canada, and as a clearing house for information accumulated from each of the provinces. This year the Committee has been requested to report on: (1) the desirability of the appointment of License Inspectors; (2) Motor Markers of a suitable design and permanent nature, and (3) Group Insurance. Should any of the members have any suggestions bearing on these special questions or other matters they are invited to send them in immediately to the General Secretary."

### QUEBEC NEWS

"The Lady Byng of Vimy Fund for Mental Hygiene was launched at public meeting held in Montreal on January 15. Dr. Chas. F. Martin, President of the Canadian National Committee for Mental Hygiene, said that the Fund would be utilized for the following purposes: (1) The stimulation of mental hygiene activities among children for the purpose of preventing insanity, controlling feeble-mindedness and treating nervous conditions. This work will be centred particularly in the primary schools, juvenile courts and reformatories of the Dominion. (2) Organization of a department of mental hygiene research for the stimulation of scientific activities in the mental hospitals of the country. (3) Co-operation with government and officials in improving and enlarging facilities for the treatment of insanity, feeble-mindedness and nervous conditions, together with the carrying on of useful activities that have been initiated by the National Committee."

### ONTARIO NEWS

"The hospitals of Ontario met and formed an association on December 13, 1923. The opinion of the meeting on one point is of interest in that they declared the standardization of hospitals asked for by the American College of Surgeons was not feasible in Ontario. Dr. Ryan of Kingston urged that Ontario should stand on her own feet in providing a standardization of her own. The association is to be known as the Ontario Hospital Association, with its president Colonel William Gartshore of London, and 1st vice-president Mrs. H. M. Bowman of the Women's College Hospital of Toronto. The aiding of the many small hospitals in Ontario is to be an important part of the organization."